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An Address
ON
ADAPTABILITY IN DISEASE.

Delivered to the Derby Medical Society on Dec. 2nd, 1926,

BY GEORGE R. MURRAY, M.D. CAMB., F.R.C.P. LOND., D.C.L.,

EMERITUS PROFESSOR OF MEDICINE IN THE VICTORIA UNIVERSITY OF MANCHESTER; CONSULTING PHYSICIAN TO THE ROYAL VICTORIA INFIRMARY, NEWCASTLE, AND TO THE MANCHESTER ROYAL INFIRMARY.

IN many diseases, and especially in those which run a chronic course, it is remarkable how well the sufferers adapt themselves to the altered conditions of their lives. This power of adaptation to adverse circumstances, or the capability of making the best of things, varies greatly in different individuals. While one sufferer from a mild chronic ailment settles down at once to an invalid existence, another with a higher degree of disability, but more courage, leads a useful and even active life for a long period. I propose, therefore, to consider briefly the adaptability of man in health and in disease, and hope to show by practical illustrations that some knowledge of his powers is a useful guide in framing a prognosis and carrying out the treatment of chronic maladies.

REACTION TO ENVIRONMENT.

In health we are constantly adapting ourselves to changes in our environment. Ready adaptability is a sign of a healthy mind and body. The late Dr. J. G. Adami [1] in his Croonian Lectures, in dealing with this subject from the biological aspect, said the worker in pathological laboratories is impressed by the fact that "direct adaptation—that is specific modification in response to a specific alteration in environment within limits which will presently be laid down—is one of the basal phenomena of living matter." He showed that the variation in virulence of pathogenic bacteria is due to adaptation. The anthrax bacillus can be made to adapt itself to altered conditions in which it loses its virulence. This modified anthrax bacillus, by adapting itself to growth in a series of animals of increasing resistance, can regain its full virulence. Thiele and Embleton,[2] by the use of anaphylaxis, succeeded in changing the saprophytic *B. mycoides* into a pathogenic and lethal microbe for guinea-pigs. Thus from the lowest forms of life up to man we find that this adaptive power is present. Adaptability is natural to youth, and it is well that is so, as the young may be called upon to make frequent changes. Owing to the modern custom of placing many private schools near the sea instead of in the country, boys, whose homes are in the town or country, have to adapt themselves to the seaside each term. This is beneficial for some boys, especially in the summer term, but it is doubtful if there is any advantage in this change in the other two terms. Some boys find this repeated migration to the seaside very trying. At the age of about 13 a boy is transferred to a public school. Nearly all our public schools and universities are inland, some even in valleys near rivers. The health of boys at these schools is certainly excellent, and it is difficult to understand why a seaside school is considered to be so important from 9 to 13 years of age, while from 13 to 18 a boy goes to an inland public school almost as a matter of course. As years advance this power of adaptation diminishes until we find in old age a conservative frame of mind, with great aversion to changes in familiar surroundings. Normal man has powers of adaptability which have enabled him to inhabit parts of the earth where all the circumstances appear to be adverse. The Esquimaux in the far north have maintained a precarious existence for generations amid surroundings which would daunt most of us. The adaptability of our own race is notorious, as it has enabled it to establish itself in all parts of the world, and so to found the British Empire which contains every kind of climate. The ease with which human beings gradually become accustomed to life at high altitudes is remarkable. Even more remarkable is the power of adaptation to rapid ascents shown by many airmen. Careful observations made during the war made it possible to devise certain tests by means of which the suitability of candidates for flying can be gauged. By this means it is possible to ascertain if a man is fit to fly to a great height or only to a moderate elevation, or is unfit to fly at all. Equally remarkable is the adaptability of men who work in compressed air in a caisson, where the pressure is usually +30 to +35 lb., but may be as high as +45 or even +50 lb. The risk attendant on such sudden changes in pressure are, of course, greatly lessened by allowing sufficient time for gradual compression and decompression in the chamber specially constructed for the purpose. The powers of rapid adaptation to severe muscular effort can be increased by careful training in health. By properly graduated exercise in training for a boat race a healthy man greatly increases his physical efficiency in the course of a few weeks. The heart and the voluntary muscles adapt themselves to the increased effort, so that by the time of the race the sculler or crew can cover the course in a much shorter time than was possible before the training commenced. During the training it is not only a question of developing more muscular power, but also of learning how to apply it to the best advantage in propelling the boat. The circulatory, respiratory, and excretory systems have to adapt themselves to meet the tremendous strain imposed on them in rowing or running a race, be it long or short.

In the case of bilateral organs, one, by means of compensatory hypertrophy, can become capable of doing double work. This is well illustrated by patients on whom nephrectomy has been performed for disease of one kidney. The remaining kidney can do duty for both for, to my knowledge, more than 20 years. The power of adaptation varies greatly in different individuals in health and in disease. We find the same difference in those who have been permanently injured by a wound or by an accident. One man, partly by his own effort and partly by the aid of orthopædic surgery, will adapt himself and his mode of life to the loss of a limb in such a way that he is as useful a member of society as he ever was. Another man appears to be overcome by his misfortune, and resigns himself to a life of little effort or use to his fellows. In America Henry Ford has shown in a remarkable way how suitable and remunerative work can be found for men with all kinds of disabilities.

ADAPTATION AND PROGNOSIS.

It will be generally admitted that prognosis is one of the most difficult branches of the art of medicine. Great difficulties confront us when we are asked to forecast the immediate outcome of an acute illness, and even greater when we are asked to outline the future course of events in the case of some chronic malady. I am, of course, not alluding to simple or slight forms of illness, in which a favourable prognosis can be given with a cheery optimism which does so much to encourage the relations and aids the recovery of the patient. In acute maladies rapid powers of adaptation come into play and are shown in the local and general reactions to infection. These adaptations may, however, cause the more obvious signs of the malady, as Sir F. W. Andrewes[3] said in his recent Linacre Lecture, "It is an evil that a tissue should become inflamed and that the body temperature should rise in an acute infection, but it is a lesser evil than that the infecting agent should overrun the body unchecked by any antagonistic mechanism." In many acute infections the medical man is in a similar position to that of the captain of a ship which has been caught in a severe storm at sea. The captain and his crew cannot stop the storm, but by skilful seamanship the ship is enabled to weather the storm and reach port in safety. A constant watch is kept.

If a leak is sprung it is counteracted by the use of the pumps, or the violence of the waves may be checked by the use of oil. In acute pneumonia we have no reliable means as yet of controlling the course of the infection or of bringing on a crisis when we wish. We can, however, do a great deal by helping our patient to adapt himself to the attack by suitable nursing and feeding, and by the judicious use of medicinal and other remedies such as the occasion may demand. On this occasion I shall refer mainly to chronic maladies which, be they mild or severe, will influence the whole of the patient's future life. A consideration of the powers of adaptation to some chronic maladies is useful as an aid to prognosis. If added to this we have some knowledge of the temperament, character, and circumstances of the patient we are all the better able to tell him what lies before him in the future. We shall, at any rate, be able to give him some general idea of what he may be able to accomplish in the way of work and recreation. In framing such a prognosis the coöperation of the general practitioner, who knows the patient, his family history and surroundings, with the physician who has had special experience of the course of the particular malady in question, is important. It will be found that the prospect of being able to lead a life of some activity and pleasure acts as a powerful suggestion to a patient to face his troubles bravely and think less of them. May not such a frame of mind even tend to check the progress of a chronic nervous disease? In the treatment of chronic maladies our aim is not only to do all we can to arrest or delay the progress of the disease, but also to enable the sufferer to make the best use of his time. A great deal can be done in this direction by indicating how he can employ those faculties and organs left to him in working order. A good example of this is seen in the modern methods of training the blind, the deaf, and the dumb, who are thereby enabled to acquire remarkable powers of doing useful work which in former times often remained undeveloped for want of suitable education. This special training is now carried out on a large scale at Henshaw's Institution for the Blind and the Royal Schools for the Deaf and Dumb at Old Trafford and other similar institutions. In exceptional cases the power of adapting life to loss of sight is extraordinary. Take, for example, the career of the late Henry Fawcett, who was born in 1833, and lost his sight in 1858, at the age of 25, through a shooting accident. In spite of this disability he held the Professorship of Political Economy at Cambridge from 1863, up to the time of his death in 1884. He was a Fellow of the Royal Society, had a distinguished political career, and was Postmaster-General in Mr. Gladstone's Cabinet in 1880. He was fond of rowing, and I can remember seeing him row stroke of an eight on the Cam when I was an undergraduate at Cambridge.

EXAMPLES FROM THE NERVOUS SYSTEM.

In recent years much attention has been paid to the problem of dealing with the feeble-minded. For more than 50 years one of the main objects of the Royal Albert Institution, which was opened at Lancaster in 1870, has been to train improvable cases to adapt themselves to make the best of their limited mental powers and to apply them to learning some useful, if simple, form of handicraft. In yet another direction the same principle is being applied in cases of chronic pulmonary tuberculosis. It has been found by painful experience that when a man returns to his home after a course of treatment in a sanatorium and is forced by circumstances to compete in the labour market with healthy men, his efficiency is only from 25 to 75 per cent. of the normal. Under the strain of this competition, and the adverse circumstances of town life, many break down again. At the East Lancashire Tuberculosis Colony which has been founded at Barrowmore in Cheshire for ex-Service men and civilians, and at other similar institutions, these men are trained in carpentry, poultry-farming, gardening, and other suitable trades, under medical supervision in the country. They learn to adapt themselves to do the kind and amount of work for which they are best fitted. Cottages for married men and a hostel for single men have been built on the estate, so that those who wish may remain to work under the best possible conditions after their training has been completed. It is, however, of the individual case as met with in practice I wish to speak in particular. As a practical illustration of what can be done, we may take a chronic disease of the nervous system, such as locomotor ataxy. This malady is due to the late action of syphilis on the sensory neurons. By the time the disease is recognisable more or less permanent damage has been sustained by these structures. Much may be done by appropriate medicinal treatment to check or even arrest the further progress of the malady. Nevertheless, at whatever stage the patient comes under observation, a certain amount of irreparable damage has been done, so that in addition to antisyphilitic and other treatment we have to teach the patient to adapt himself to his disability and make the best use of those parts of the nervous system which remain intact or are but slightly affected. Owing to loss of muscular sense the ataxy is a serious disability in many cases. Muscular power may be quite adequate for all ordinary purposes, but owing to lack of control it is ineffective. Efforts are instinctively made to correct this difficulty by watching voluntary movements so that sight by degrees takes the place of the lost muscular sense. Prof. J. B. Leathes,[4] in a recent address, indicates that with the nervous system "the work of Pavlov has made one thing clear, that by a physiological reaction in it machinery may come into existence which did not exist before." It may therefore be possible, by repeated and suitable actions, not only to improve functions already performed, but create new conditioned reflexes in those who have lost some portions of the nervous system by disease. We can greatly assist this process by the employment of re-education exercises, carefully adapted to the needs of each individual case. One of my patients was so ataxic when he was admitted to the Manchester Royal Infirmary that he was quite unable to walk. After a few weeks' training he was able to walk about the ward, though in other respects his physical condition remained practically the same. Some years ago a middle-aged man came to consult me on account of a painless swelling of one foot which prevented him from putting on his hunting boots. At first he was very reticent about his past history. On examination he was found to be suffering from tabes dorsalis, with a Charcot's joint. Finally he gave his history, and it transpired that the malady had been present for many years, and ten years previously he had suffered severely for a time from gastric crises. These ceased, and for ten years he had been able to conduct his business and to hunt and to shoot regularly. As this seemed to be a remarkable performance, I asked how he was able to do all this. He admitted that in hunting he fell from his horse rather too frequently, but had sustained no serious injury. In covert shooting, which is a very delicate test of coördination of the movements of the head and arms, his shooting was quite up to the average of the rest of the party, but he had to be careful to avoid taking birds passing directly overhead, as in firing at a bird in this position he was apt to lose his balance and fall on his back. Another example of the long duration of the same malady was afforded by the case of a cavalry officer who, while on active service in one of the campaigns of last century, had symptoms which ultimately proved to be due to an early stage of tabes. Although he was ataxic and suffered terribly at times from lightning pains, he was alive and able to travel about the world 34 years after the onset of the disease. Among those who have suffered from infantile paralysis in early life we meet with remarkable examples of adaptation. By the aid of exercises, massage, orthopædic operations, and apparatus, muscles are trained to carry out new functions and so to compensate for the loss of those

which have become atrophied and useless. I know one very plucky girl who, in spite of paralysis of both legs, learned to propel a wheeled chair, took a degree with honours at a university, followed by a special course of training in languages and in secretarial work, and now is able to go about alone and do her work in a large city.

In cases of hemiplegia, or more correctly of hemiparesis, of long standing, patients may adapt themselves remarkably. One man I know has suffered from hemiparesis from early life, but nevertheless has become an expert rock climber. Epilepsy is another nervous malady from which men of great intellectual attainments have suffered and yet have become famous in history.

CIRCULATORY SYSTEM.

In diseases of the circulatory system we meet with remarkable examples of adaptation. It is well known that the cardiac muscle in young subjects readily hypertrophies to compensate for valvular defects resulting from acute endocarditis. Compensatory hypertrophy is an important factor in diseases of the heart which occurs not only in the young but also in those past middle life, provided the myocardium remains sound. The need for compensation in these older persons may arise from sclerotic valvular disease or from the additional cardiac effort required to maintain the circulation when the blood pressure is raised in cases of renal and arterial sclerosis. Familiar as these results are, it is hardly realised how long this early adaptation may be maintained in some subjects.

Many years ago I was asked to examine a physician who was then about 90 years old. I found marked but well-compensated mitral incompetence. He then told me that the valvular lesion had been present for 70 years. It had followed an attack of acute rheumatism which had occurred at about the age of 20. He had led an active life as a consulting physician on the staff of a general hospital and lecturer at a medical school. By taking reasonable care he had avoided inconvenience from this cardiac lesion throughout a very long life.

A friend furnishes another example of what can be done by sufferers from valvular disease of the heart. As a young man he had several severe attacks of acute rheumatism, in one of which I examined him. At that time he had well-marked aortic and mitral incompetence well compensated by dilatation and hypertrophy of the left ventricle. During the 30 years which have since elapsed he has been very successful in business, has become a well-known Member of Parliament, and has married and brought up a family.

I may also mention the case of another successful man of business who at the age of 25 had mitral incompetence, and had been taken by his medical man to consult a physician in London who gave him sound advice. For 50 years he led an active life in business and public affairs, and was able to shoot regularly each autumn. Between 70 and 75 he had one attack of broncho-pneumonia, and later on, acting on my advice, as his mitral lesion was so well compensated, he had a very successful gastro-enterostomy performed for a simple pyloric stenosis. At 75 he went out shooting while suffering from a mild attack of broncho-pneumonia, and when he gave in and sent for his doctor was found to have auricular fibrillation. When I saw him two days later he was doing well. The physical signs of mitral incompetence with compensatory hypertrophy remained as before and as they probably had been for 50 years. He made a good recovery, and although the irregularity of the pulse persisted he was able to go out and shoot 40 rabbits in an hour and a half.

I may refer to a case described by Prof. Edwin Bramwell:[5]

The patient was a man aged 52, who early in life had an attack of rheumatic fever, and when examined was found to have typical aortic incompetence. At the age of 26 he had been advised by three distinguished physicians who all said he must take life easily and avoid physical exertion. At the end of three months he was tired of the restrictions and returned to his former mode of life, hunting three days a week, and shooting regularly. His heart had never troubled him, and it was not until ten years later, when he was 62, he developed symptoms of angina pectoris from which he eventually died.

In these cases so well has the cardiac muscle adapted itself to the valvular lesion that it is able to carry on until senile changes commence and the compensation fails. Even in the case of such serious conditions as heart-block, life may be prolonged, and Dr. John Cowan[6] mentions that Sir William Gairdner lived for seven years with full heart-block, and one of Vaquez's patients for 15 years. Even when auricular fibrillation has become permanently established, life may be prolonged for years. One of Dr. Cowan's patients worked as a miner for 79 of the last 108 months of his life, although his auricles were fibrillating all the time.

One of my patients has suffered from complete heart-block for several years and is liable to Stokes-Adams attacks. Nevertheless he goes to business regularly by tram car. He is well known to the conductors on the cars by which he travels, and has arranged with them so that whenever he has an attack of loss of consciousness in the car he is laid on the seat until he recovers. As soon as the attack is over he goes about his business as usual.

CHRONIC PULMONARY DISEASE.

Among cases of chronic pulmonary disease we find many suitable illustrations. We are all familiar with cases of phthisis in which arrest has taken place at an early stage and an almost normal life has been possible afterwards. A young medical man who was in practice in a northern town came to consult me some 24 years ago. I found physical signs of early pulmonary tuberculosis at the apex of one lung, and tubercle bacilli in the sputum. On discussing the situation with him I ascertained that he could only arrange to leave his practice for six months for rest and treatment. He spent this time at Davos, and occupied much of his time playing bridge out of doors with three other patients. This was rather chilly work, and so a hot-water bottle was passed round to each player to warm his hands before dealing the cards. Even such a short course of treatment proved most satisfactory, as the disease was arrested and he was able to resume his practice at the end of the six months. He now weighs 13 st., and is still at work. Several of my friends have been through a similar experience, and after recovery have achieved great distinction in our profession. Such recoveries are fortunately of frequent occurrence. I wish, however, to show how some really serious cases of chronic disease can nevertheless lead active and interesting lives.

In cases of chronic pulmonary disease as much as half of the pulmonary tissues may be so much involved as to be practically functionless, and yet a useful life is still possible.

A good example of this was furnished by a friend who when quite a young man had suffered from fistula in ano, and presumably had been tuberculous from that time onward. He came under my observation much later in life. He then had a cough of many years' duration, though his general health was good. He had well-marked signs of chronic fibroid tuberculosis of the lung. Tubercle bacilli were only found in the sputum on one occasion while he was suffering from influenza. He developed tuberculosis of one testicle which was removed. The vesiculæ seminales were probably also involved, as he still continued to pass tubercle bacilli in his urine, and there was no evidence of renal infection. At another time he had a tuberculous abscess at the crest of the ilium. These events were spread over a number of years, during which he was the managing director of important engineering works. He carried on his work until the natural time for retirement arrived, and lived until he was over 70 years of age. Thus, in spite of chronic tuberculosis, he carried on an active career for just as long as a normal man. He unfortunately acted as a "carrier." His only son developed pulmonary tuberculosis and died after an illness of some five years' duration. The housemaid developed caries of the spine and was reported to have died later of tuberculosis. These two cases were evidently infected by a chronic carrier, but being endowed with less resistance they both died long before he did.

A remarkable history was given in the case of a man of great intellectual attainments whom I only saw a few days before his death at the age of 69. He had a first attack of paroxysmal tachycardia at the age of 13. At 20 he developed tuberculosis of the right lung. The attacks of tachycardia recurred at intervals for 53 years. At one time he used to stop the attacks by running up a staircase. Later in life

he found the best means of arresting the attacks was to drink a small bottle of champagne. He had also at various times suffered from hæmoptysis. He had always insisted on leading a very full life. Not only had he taken an active part in business, but he was a leader in politics, and was deeply interested in philosophy. Even at the end of his life he was engaged in writing a book on an abstruse subject. When I saw him the whole of the right lung was extensively fibrosed with an old cavity in the upper lobe. The upper lobe of the other lung was also affected. The attacks of paroxysmal tachycardia had become more severe, the pulse-rate being 160 during the attacks and 80 during the intervals between them. He had developed Cheyne-Stokes respiration and died a few days later.

The cases I have described serve sufficiently to show how those who suffer from chronic cardiac or pulmonary disease may successfully adapt themselves to the limitations imposed by their maladies. They show that in suitable cases we may urge our patients to lead fairly active lives, but naturally such cases require careful selection. Sometimes the patient appreciates his own powers and limitations better than we can, and may be allowed to use his own judgment. We find the highest powers of adaptation in cardiac cases in which the valvular disease has arisen in early life as the result of rheumatic endocarditis and the myocardium has escaped any permanent injury so that it is capable of undergoing adequate compensatory hypertrophy. In the case of valvular lesions which develop later in life, as the result of syphilis or senile sclerosis of the valves, adaptability is much less owing to the myocardial changes which are often present in these cases, but even in these cases a quiet but useful life is often quite possible. One elderly patient, who suffered from angina pectoris, told me that as long as he did not attempt to walk at more than two miles an hour he was free from pain, and at this pace he could cover as many as 15 miles in the day. If he accelerated his pace, even to three miles an hour, he was apt to bring on an attack of angina. He had, however, adapted himself to walking at two miles an hour, and so was able to enjoy long walks in the country without discomfort. Speaking generally of cardiac and pulmonary maladies, early onset and arrest of the disabling disease leaves the greatest power of adaptation. The later the disease occurs in life the less prospect there is of good adaptation. Even in late cases, however, a good deal may be done to help the patient to make the best of things if not only his physical condition but all the surrounding circumstances of his life are fully considered.

ENDOCRINE DISORDERS.

Among diseases of the endocrine glands acromegaly furnishes an illustration of my subject. In cases of this malady life may be prolonged for many years. Two notable examples of the good use which can be made of these years have been furnished by members of our profession. Dr. Leonard Mark,[7] in his most interesting description of his own case, not only gives a graphic account of the early symptoms, but shows how a brave man carried on his work, in spite of this adversity, for many years. A distinguished American surgeon, who has achieved a world-wide reputation, has also continued his career although afflicted by this disfiguring and disabling malady.

A remarkable example of another disease of the pituitary gland, adiposis dolorosa, was admitted to the Manchester Royal Infirmary under my care last year. The details of this case have not yet been published, but may be briefly referred to here.

The patient was a married woman aged 44, who gave a history of five years illness. She had four children living. During the last five years she had gradually become heavier until at the time of her admission she weighed 26 st. 8 lb. She presented the typical appearance of a case of Dercum's disease. The characteristic folds of adipose tissue were very large and the abdominal wall hung down like an apron to the level of the upper part of the knee-joint. Owing to this state of affairs she could only go a few yards away from home without some means of conveyance. In spite of the disability she had an active mind and was so devoted to her family and to her domestic duties that she insisted on returning to her home after a short stay in the hospital.

The reason I refer to this case is that in order to adapt herself to her condition and carry on her housework she always carried a chair with her. Thus she was just able to move from one part of her house to another, and then promptly had to sit down on the chair to do all her work. In this way she was able to look after her family and house in a most exemplary fashion, when many another woman would have given in and become a chronic invalid.

In the treatment of Graves's disease rest is of great importance. In many cases, unfortunately, owing to the domestic circumstances of the patient, adequate rest, for the long period required in such a protracted malady, is not possible. In spite of such difficulties it is remarkable how well many patients adapt themselves to the best kind of life which is possible under the circumstances. By retiring to bed early in the evening and taking as much rest as possible at the week-end, many patients are able to carry on their employment and earn a necessary living throughout their illness. Recovery is probably considerably delayed in these cases, but may be ultimately attained under suitable treatment. In other cases the intolerance of idleness is so great that it is advisable to give some occupation, even where there is no need to work for a living. One of my patients, who passed through a severe attack of Graves's disease, of several years' duration, to complete recovery, spent part of her time in learning the Turkish language.

Some of the diseases of the spleen run a prolonged course, and so call forth the powers of accommodation to the limitations which they impose. Take, for example, that rare and interesting malady, polycythæmia rubra, in which, associated with a large spleen, there is a great increase in the number of the red blood corpuscles.

Some years ago I saw with a friend a member of the legal profession, aged 38, who at the time was laid up with an acute attack of pain in the left side of the abdomen associated with a high temperature. For seven years before this attack the increasing redness of his face had called forth uncomplimentary, but quite erroneous, comments as to his habits. On examination he was found to be suffering from polycythæmia with recent acute perisplenitis. The spleen extended down to the level of the umbilicus, and on auscultation friction sounds could be heard all over it. He made a good recovery from the attack of perisplenitis, and 11½ years afterwards—that is, probably 18 years after the onset of the malady—he was still in the active practice of his profession.

CONCLUSION.

There is no necessity for me to multiply examples to illustrate my subject, as it is to those engaged in general practice that we must look for further information as to the capacities of those who suffer from chronic maladies. A careful study of these capacities in each case as it comes before you, and sound advice based on these observations, will do a great deal not only to improve the condition of your patient but will enhance his enjoyment of life by instilling fresh hope when he realises that he can still do some useful work in life.

I have endeavoured to show that adaptability, which is a common property of all forms of life, is a very important factor in man in both health and disease. In disease, and specially in chronic disease, due allowance must be made for this capacity in framing a prognosis. A practical experience of what the victim of a chronic malady can do by conscious and unconscious adaptation is of great value not only in encouraging him to make the best of his life but also in giving suitable advice as to how this may best be accomplished. I wish, therefore, to make a plea for a fuller study of every case of chronic disease so as to estimate his remaining powers and possibilities as accurately as possible. When his capabilities have been gauged, it may be possible in many cases, as I have shown by practical illustrations, so to order his life that it becomes far more useful and enjoyable than before. In this way many a patient may be saved from drifting into an existence which is clouded by unnecessary pessimism.

(*References at foot of next page.*)

THE CLINICAL OCCURRENCE OF SINO-AURICULAR BLOCK.

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ALTHOUGH in a vast majority of cases an intermission of the pulse is due to an extrasystole, or in a minority to a slight heart-block with dropped beat, there have proved to be occasional intermissions resulting from neither of these irregularities. In some of these exceptional cases a characteristic polygram and electrocardiogram has been found and the term sino-auricular block has been applied to the condition. It was first used by Wenckebach in 1907 [32] in describing a phenomenon comparable with auriculo-ventricular block, but where instead of an auricular beat failing to influence the ventricle (missed ventricular beat), the auricular, as well as the ventricular contraction, failed to appear on the polygram—a whole heart beat was missed. In other words, there was a pause in the record equal to two cycles, suggesting that the sinus had produced an impulse which had been blocked and a whole heart beat had been lost (sino-auricular block).

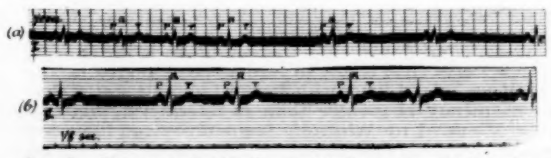
Four cases will now be described to illustrate the condition.

Clinical Records.

CASE I.—Male, aged 65; tailor. Three years ago giddiness one morning on rising; consulted doctor, who remarked that pulse was slow. Pain in the back and in the right shoulder, induced by exertion, worse last six months; slight palpitation, some breathlessness and exhaustion. Moderate smoker, abstainer; no history of previous illness or infection.

Examination.—Moderate obesity. Pulse intermittent. Heart sounds distant. Short systolic murmur at aortic area. Blood pressure, 190 systolic, 90 diastolic. Slight œdema of ankles. Urine normal. Wassermann reaction negative. Radioscopy, globular heart, apex just external to nipple line, slight enlargement to the right; aorta normal. Pulse was not always irregular, but if so it showed frequent

FIG. 1.



Case I.—Sino-auricular block. In (*a*) the pause, which is almost exactly double two normal cycles, is ushered in by a slight quickening of the whole heart. Thereafter there is a succession of long cycles of the same length. In (*b*) bigeminy due to 3 : 2 sino-auricular block.

"dropped beats." Rate varied between 56 and 72 beats a minute. Patient at no time was conscious of these intermissions and suffered no inconvenience from them. His symptoms were ascribed to chronic arthritis, with a moderate degree of hyperpiesis. When the pulse was irregular the electrocardiogram was as in Fig. 1. During the 14 months of subsequent observation several electrocardiograms were taken, all of which were similar to Fig. 1, with exception of the last, which showed sinus bradycardia only. The same minor symptoms and signs were present and the blood pressure was systolic 170, diastolic 80.

CASE II.—Male, aged 31; medical man. Had noticed irregularity of the heart for some ten years, since student days. Typhoid aged 12. Life-long non-smoker and abstainer. Complained of headache on walking. Not fond of exercise.

Examination.—No abnormal cardiac signs. No enlargement (radioscopy). Blood pressure: systolic 120, diastolic 80. Urine normal. Polygram showed sino-auricular block, confirmed by electrocardiogram (Fig. 2).

FIG. 2.

Case II.—Sino-auricular block. In this instance the pause, which measures nearly two normal cycles, is not preceded by any quickening of the heart, though the cycle immediately succeeding the intermission is longer than normal.

CASE III.—Male, aged 51; warehouseman. Influenza one year ago, not well since. Two months ago felt suddenly ill and fainted; two weeks ago fainted again. Absent from work eleven weeks. Shortness of breath and slight pain over left margin and lower end of sternum. No history of rheumatic fever. Abstainer and moderate smoker.

Examination.—Pulse irregular showing dropped beats; rate varied between 60 and 70 beats a minute (Fig. 3). Heart not enlarged. No symptoms and no signs of failure. Blood pressure, systolic 135, diastolic 100. After one month's

FIG. 3.

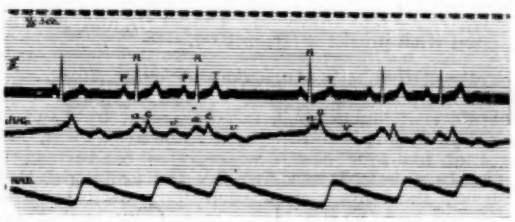
Case III.—Sino-auricular block. The pause is almost exactly equal to the two cycles preceding it. The P.-R. interval is shorter after the pause.

observation an electrocardiogram showed no arrhythmia and at this time patient was at work and feeling well. Two months later still slight irregularity was present; rate 62 beats a minute. One year after the first visit an electrocardiogram showed no pauses and no arrhythmia and he had no complaints.

CASE IV.—Male, aged 41; furniture packer. Pain under left breast, some breathlessness, faintness, palpitation and exhaustion, all for two years.

Examination.—Heart not enlarged (radioscopy). Blowing systolic murmur at the apex, pulse irregular, occasional "dropped beats," varying between 60 and 70 beats a minute (Fig. 4). Blood pressure, systolic 140, diastolic 70. Wassermann reaction positive. No symptoms and signs of failure. Moderate smoker and moderate drinker. Atropin

FIG. 4.



Case IV.—Triple record of sino-auricular block. Electrocardiogram shows a pause nearly equalling two normal cycles. The P.-R. and A.-C. intervals are lengthened in successive beats before the pause. This record was taken while respiration was held.

gr. 1/100 subcut. reduced the number of pauses. After two years' observation condition was much the same. After five years' observation patient complained of nothing more than lassitude. Electrocardiograms still showed sino-auricular block.

The cases recorded in the literature before 1916, 14 in number, are fully dealt with by Levine [14] who

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gives a comprehensive table of them, together with four of his own. His collected cases are one of Mackenzie,[16] four of Joachim,[12] two of Wenckeback,[32] one of Hewlett,[11] one of Gibson,[9] one of Rihl,[22] one of Laslett,[13] two of Riebold,[21] and one of Schott.[26] He points out that the arrhythmia occurred after digitalis in ten cases, disappearing when its administration ceased. In four of the eight others this drug was not given and in the remaining four there is no note on the subject, though in two it may have been given, as heart failure was present. Four cases were subject to paroxysmal auricular fibrillation (two of Levine,[14] Laslett,[13] and Riebold[21]). His own cases showed pauses equal in length to multiples of the normal heart cycle.

He thinks that the variation in length of the normal cycle is due to a change in the rate of the pacemaker or in the time the impulse takes to reach the auricular musculature. It is not due entirely to the latter, for the P-P interval would become gradually longer until one sinus beat would be blocked; in one of his cases, the P-P intervals become shorter before the pause (cf. Lewis), as if the conduction of the impulse improves. Sometimes the intervals lengthen and then shorten without any blocked beats, and in one instance of his an impulse is blocked after a short beat. The block depends on slight sinus arrhythmia. Whenever the sinus rate increases beyond a certain point the node fails to conduct the impulse to the auricles.

Forms of the Irregularity.

The irregularity may take several forms; (*a*) the heart may intermit occasionally as described above; or (*b*) beats may be separated into groups by regular recurrence (as in Cases 1, 2, 5, 9, 10, 32, I.); or (*c*) there may be abrupt slowing or quickening (Case 12, also reference 16, Fig. 368[3]). Sometimes the rhythm is abruptly halved, but more often the rate is slightly more than half the rapid rate, each of the long cycles being less than two of the short ones taken together; or there may be rarely a continuous bradycardia of perhaps 30 beats per minute (Case 11), which is distinguished from other forms of slow action by the way in which it accelerates in response to exercise, doubling at once, then quickening gradually, then after exertion slowly decreasing to 80 or 70, and then halving suddenly to its original rate. The most recent discussion of the several forms of this irregularity is that of Lewis.[15] Levine[14] describes a case in which the intervals were usually approximately double, but sometimes simple multiples of the normal beats and occasionally longer than two normal cycles, once equalling five cycles; this appears to be a parallel instance to three cases mentioned by White,[33] (his Cases 14, 15, and 16) of complete auricular standstill, which he terms complete sino-auricular block (from digitalis); this appears to be the only reference to complete blocking. Long pauses of similar nature can be produced by pressure on the vagus nerve in the neck and in morphinised dogs with excised vagus (Robinson and Draper[23]), and in dogs injected with pituitrin (Resnik[20]).

Association with Auriculo-ventricular Block.

The frequent association of sino-auricular with auriculo-ventricular block is emphasised by Lewis,[15] who says that it is too frequent to be accidental. In three of his four electrocardiograms conduction is distinctly impaired as shown by the prolonged P-R interval, shortening after each long diastole (also Cases 6, 8, and IV. (Fig. 4)). In my four cases there is no auriculo-ventricular block, except in Case IV., where the P-R interval is prolonged (Fig. 4).

There have been a great many experiments on various types of animals, both warm-blooded and cold, designed to solve the problem of the origin of the impulse and the causation of sino-auricular block. Thus, in 1910 Hering[10] cooled the sinus region in dogs and since then the node has been injured, Stannius ligatures have been applied and various procedures have been adopted to cut off communication between the whole node or different portions of the node and the auricle. Cushny,[3] employed aconitine and electrical stimulation, Eyster and Meek,[7] with textile leads worked out with great care the course of negativity which passes over the heart of a tortoise, and the same authors in another paper describe a great number of experiments which seem to show, among other things, that special paths of conduction exist in the auricles. Rothberger[24] concludes from some recent experiments that there are two such paths from the lower end of the node, and Poulton and Dowling[19] believe that there is some direct connexion between node and ventricle, irrespective of the contracting auricle. The existence of any such tissues of conduction between sinus and auricle is strenuously denied by Lewis on both anatomical and physiological grounds.

Resnik,[20] in December, 1925, conducted some experiments at the Johns Hopkins Hospital on dogs with 0·5 to 1 c.cm. of pituitrin, taking one lead from the sino-auricular node itself, the other being the ordinary lead II. From these (three are published) he deduces that instead of there being a block between the node and auricle, the former fails to originate an impulse at all, the result of vagal influence. He suggests the name "sino-auricular standstill."

Ætiology.

The ætiology of sino-auricular block is often uncertain. Digitalis has been cited as one of the causes by many authors (Levine,[14] Lewis,[15] Parkinson,[18] White,[33] and Cases 2, 4, 6, 7, 8, 14, 15, 16, 18). In the cases collected by Levine[14] it is to be noted that the use of digitalis was recorded definitely in 56 per cent. of them, whereas in those included here the use of the drug was noted in only 25 per cent. In the last figure are included White's three cases (Cases 14, 15, and 16) of complete sino-auricular block at Massachusetts General Hospital, but in a later publication[34] he mentions that he has observed six cases in which digitalis was primarily responsible.

Other occasional causes reported are tobacco (Neuhof,[17] Cases 30, 31), atropine (Smith,[28] Case 20), salicylates (Sicard and Meara,[27] Cases 3 and 4), and obscure vagal influences. Levine[14] adds febrile conditions, particularly rheumatic fever and chronic myocarditis, to the list, and White arteriosclerosis and hypertension.

Frequency.

There is no doubt that the condition is infrequent. Smith[28] says that is not so rare as the paucity of the literature would have us believe; Levine[14] states that its frequency is greater than is recognised, and this view is shared by White.[33] Some observers have too readily accepted the pauses so common in pronounced sinus arrhythmia as due to sino-auricular block. Smith[28] is careful to emphasise this and admits that at least two of his cases (Cases 25 and 26) might be interpreted as examples of the former.

It is certain that cases are rarely seen at a clinic such as that of the National Hospital for Diseases of the Heart, though practically all irregular rhythms are investigated by the electrocardiograph. Not more than 11 cases at most had been observed at the Massachusetts General Hospital from 1914 to 1922.[34]

Symptoms and Associated Conditions.

There are no symptoms indicative of sino-auricular block, and patients are not conscious of the intermissions. In Case 9 (Straub[10]) alcoholic neuritis was present, and this is the only mention of alcohol as a concomitant. In the author's Case 2 the patient was a life-long abstainer. Smith's[28] cases (19, 20, 21) were from diphtheria wards, Schirmer's[25] (Case 32) had diphtheria bacilli in the throat, and Andersen's[1] (Case 29) had a history of diphtheria. Some, however, of Smith's cases were suffering from other zymotic diseases—mumps (Case 23) and pertussis (Case 24). Venereal disease is mentioned in Straub's cases and in Case 4, and also in the former the fact of treatment with mercury, the Wassermann reaction was negative, but the Sachs Gorgi positive. In Case 4 the

TABLE OF CASES REPORTED IN THE LITERATURE, 1916–26.

No.	Case and associated conditions.	Special features.
1	Stokes. Female, 36. Arteriosclerosis; anginal pains.	History of rheumatic fever and typhoid 3 : 2, 4 : 3, 5 : 4 types. Atropine effects. Polygrams.
2	Danielopolu. Male, 70. Slight cardiac failure; emphysema.	Digitalis used. History of rheumatic fever. 3 : 2, 4 : 3, 5 : 4 rhythms. Atropine effects. Swallowing temporarily abolished block.
3	Sicard and Meara.	Occasional dropped beats. Salicylates.
4	Sicard and Meara. Male. Acute rheumatism; endocarditis.	Digitalis used. Salicylates. Polygram.
5	Eyster and Evans. Male, 31. Healthy.	2 : 1, 3 : 2, 4 : 3 types. Atropine effects. Nodal rhythm present. Vagal stimulation effects.
6	Parkinson. Male, 35. Anginal pains.	Digitalis used. History of rheumatic fever and typhoid. Occasional pauses. Atropine effects. Pressure on eye and vagi had no effect. A-C interval increased.
7	Straub. Male, 31. Aortic incompetence, mitral stenosis, nephritis.	Digitalis used. Occasional pauses. Electrocardiogram.
8	Straub. Male, 59. Syphilis, gonorrhœa, iritis.	Digitalis used. 2 : 1, 3 : 2 rhythm. P-R interval increased.
9	Straub. Male, 29. Dyspnœa.	History of rheumatic fever. 3 : 2 type. Quinidine temporarily abolished block. Electrocardiogram.
10	Straub. Male, 75. Alcoholic neuritis.	3 : 2, 2 : 1 type. Electrocardiogram.
11	Gallavardin et Dumas. Male, 37.	Pulse-rate 34 beats a minute. Rate doubled on violent exertion. Block temporarily abolished by swallowing.
12	White. Male, 34. Athlete.	Halving of rate one minute after running ½ mile. Electrocardiogram.
13	White. Female, 33. Obscure cough.	
14, 15, 16	White.	Three cases of complete sino-auricular block at Massachusetts General Hospital. Digitalis used in each.
17	White. Aged 56. Cardiosclerosis; slight failure.	—
18	Straub. Male, 47. Dyspnœa; cardiac pain.	Digitalis used. Extrasystoles. Some of the pauses due to ventricular escape. Electrocardiogram.
19	Smith. Aged 5. Three months after diphtheria.	
20	Smith. Aged 4. Acute diphtheria.	Atropine and strychnine caused block. Electrocardiogram.
21	Smith. Aged 8. Diphtheria; convalescent.	Mental stimulation caused block to disappear.
22	Smith. Aged 6.	Block disappeared on fretting.
23	Smith. Aged 6. Mumps.	Fourteenth day after swelling observed.
24	Smith. Aged 4. Pertussis.	Block present 13th day between paroxysms.
25	Smith. None.	Present after exercise.
26	Smith. Aged 19.	,, ,, ,,
27	Brown. Male, 11. Acute arthritis; heart enlarged.	Salicylates. Frequent pauses. Atropine effects. Vagal stimulation effects. Electrocardiogram.
28	Poulton and Dowling. Left hemiplegia; hyperpiesia.	History of recent lobar pneumonia. Block persisted for 12 years. No atropine effects; vagal stimulation effects present.
29	Andersen. Male, 25. Heart enlarged.	History of diphtheria, scarlet fever, and influenza. 3 : 2, 4 : 3 rhythms. Quinidine temporarily abolished block.
30	Neuhof.	Tobacco.
31	Neuhof. Myocarditis; cardiac failure.	,,
32	Schirmer. Heart enlarged.	2 : 1, 3 : 1 types. Diphtheria bacilli in throat.
I.	Male. Aged 65. (see text).	Occasional dropped beats, also 3 : 2 type. Observed 14 months. Electrocardiogram.
II.	Male. Aged 31. (see text).	Occasional dropped beats.
III.	Male. Aged 51. (see text).	Occasional dropped beats. P-R interval shorter after the pause. Observed one year.
IV.	Male. Aged 45. (see text).	Occasional dropped beats. P-R interval lengthened before the pause. Observed five years.

Wassermann reaction was positive, though were there no clinical signs of syphilis. There was a history of rheumatic fever in seven (Cases 1, 2, 3, 4, 6, 9, 27) and of typhoid in three (Cases 1, 6, 11). The general association is very much as outlined by Levine[14] and White[34]—(supra) myocarditis, rheumatism, general cardiosclerosis, and febrile conditions, but in many there is no discoverable cause or association of importance.

Atropin is shown to have temporarily abolished the block in five cases (1, 2, 5, 6, 27), swallowing in three (2, 5, 11), quinidine in two (9, 29). Pressure on the vagi increased the irregularity in three cases (5, 27, 28) and on the eyeball in two (11, 27). It is noted that in one case[6] pressure on vagi and on the eyeball had no effect. Exertion, physical or mental, increased the arrhythmia in four cases (6, 22, 25, 26), and in one [31] caused it to disappear. In one case[11] the heart-rate doubled on exertion and in one[12] it halved one minute after violent exercise.

Diagnosis.

The condition can only be diagnosed by graphic methods. A slight preparatory quickening of the whole heart, followed by a pause equalling approximately two normal heart cycles with a total absence of "P" or "a" waves, occurring either alone or grouped, as above, is seen on the record. Sino-auricular block must be differentiated from (*a*) the extrasystole, (*b*) the occasional dropped beats of auricular-ventricular heart-block, (*c*) sinus bradycardia with ventricular escape, (*d*) a blocked premature auricular contraction, and (*e*) sinus arrhythmia, which often simulates sino-auricular block very closely. Resnik [20] obtained in his experiments practically complete transitions between sino-auricular "stand-still" and sinus arrhythmia. He regards the condition as a special form of sinus arrhythmia.

Prognosis and Treatment.

There is little or nothing in the literature on the subject of prognosis. Schirmer's case (Case 32) was reported as recovered and the four cases here described have shown no serious signs.

No treatment is necessary. The condition is not pathological, is present in a few hearts, and may be regarded as physiological. It does not by itself necessitate any interference with the patient's mode of life and can be neglected in considering his future.

Summary.

1. Four cases of sino-auricular block are described and a tabular summary of published cases since 1916 is furnished. 2. It is a rare cause of intermission of the pulse, in which a whole heart beat fails to appear, and it is only recognisable by graphic methods. 3. Atropin usually abolishes the block temporarily. Pressure on the bulbus oculi and also on the vagus has varied effects. 4. Ætiologically no one factor is responsible, though many cases are definitely due to digitalis administration. Other suggested causes are the use of tobacco, salicylates, and infective conditions. 5. There are no characteristic symptoms in association, and it produces none. 6. The condition may be present without any symptoms or signs of cardio-vascular disease, but it is often accompanied by slight grades of auriculo-ventricular block or other signs which indicate associated myocardial disease.

I wish to express my thanks to Dr. John Parkinson, physician to the hospital, for permission to use the four cases shown and for his help.

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GASTRIC SECRETION IN GRAVES'S DISEASE.

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REHFUSS tests were made on 50 cases of hyperthyroidism. Of these 22 showed achlorhydria. They comprised 19 cases of Graves's disease and three of forme fruste. Of the 19 cases of Graves's disease with achlorhydria, 15 were of more than two years' standing. Hypochlorhydria occurred in 15 cases. Of these, four were acute cases of Graves's disease, all of less than 11 months' standing; six of Graves's disease of one year or more, four of toxic adenoma, and one of puberty hyperplasia. Normal chlorhydria occurred in nine cases. Of these, three were acute cases of Graves's disease of less than one year's standing, one of chronic Graves's disease undergoing X ray treatment, two of toxic adenoma, two of forme fruste, and one of puberty hyperplasia. High normal secretion was found in only four cases, the acidity (free HCl), however, never reaching higher than 65 (N/10 NaOH). These cases comprised one of puberty hyperplasia, one of forme fruste, one of toxic adenoma, and one of chronic exophthalmic goitre. Table I. is a summary of these cases.

TABLE I.

—	Achlorhydria.	Hypochlorhydria.	Normal.	High N.
Chronic Graves's disease (of more than two years' standing) ..	15	6	1	1
Acute Graves's disease (of less than one year's standing)	4	4	3	—
Toxic adenoma	—	4	2	1
Forme fruste	3	—	2	1
Puberty hyperplasia ..	—	1	1	1
Total	22	15	9	4

The average duration of symptoms in cases of Graves's disease with achlorhydria was 2·9 years; in cases of Graves's disease with hypochlorhydria, 1·1 years; of Graves's disease with normal secretion, 0·5 year. Thus in the more acute cases the gastric secretion was least diminished. This suggests that the diminution of HCl secretion occurs in the course of the disease, and is not, in the majority of cases, a predisposing cause.

Table II. is a summary of the charts of the 50 test-meals.

TABLE II.

—	Achlorhydria.	Hypochlorhydria.	Normal.
Mucous secretion	N.	N.	N.
Percentage of cases with rapid emptying stomach	90	50	24
Time of disappearance of starch or sugar in hours	0·89	1·5	2·1
Percentage of cases with much bile	60	50	40
Free HCl (N/10 NaOH) (a) ..	—	15	47
Free HCl (N/10 NaOH) (b) ..	—	20	65
Free HCl (N/10 NaOH) (c) ..	—	5	35
Total acidity (N/10 NaOH) (a)	27	42	59
Total acidity (N/10 NaOH) (b)	40	60	80
Total acidity (N/10 NaOH) (c)	15	32	40

N = normal. (a) average, (b) maximum, (c) minimum.

The chief conclusions to be drawn from these findings are: (1) There is a constant tendency towards subnormal or absent secretion of HCl in Graves's disease. (2) The secretion of HCl in cases of toxic adenoma and puberty hyperplasia is usually normal or subnormal but never absent. (3) There is a strong tendency to regurgitation of bile in Graves's disease. (4) The stomach empties very rapidly in Graves's disease. (5) The total acidity is usually high in cases of achlorhydria.

The rapidity of emptying of the stomach in Graves's disease is sometimes extraordinary. In two cases the stomach contents passed into the duodenum in less than a quarter of an hour. Each of these two cases showed achlorhydria and bile in practically every sample. It was thought that the stomach-tube might have passed into the duodenum, but on repetition of the tests similar results were obtained. A third test was made in one case when the patient was beginning to respond to treatment, and in this case starch was found after a quarter of an hour and sugar up to half an hour.

Explanations of Deficient Secretion of HCl in Graves's Disease.

There are four plausible explanations of the lack of secretion of HCl in Graves's disease.

The first is that the general toxic state of the patient leads to a catarrhal condition of the stomach. This produces a physical obstruction to the work of the oxyntic cells, and the dilution and bathing of the stomach contents with mucus prevent the chemical stimulus to the secretion of gastric juice. The resultant low acidity allows rapidity of emptying of the stomach through lack of chemical stimulus to the pylorus. The objection to this theory is that the mucous secretion in the Graves's disease cases was not found to be greater than in cases with normal chlorhydria.

The second explanation is that the low secretion of HCl is a congenital defect and provides a mode of entry into the intestinal tract for living bacteria. The problem may be viewed in the same light as is the problem of achlorhydria in pernicious anæmia. McCarrison [2] has put forward many suggestions on behalf of this theory. He points out that correction of intestinal stasis has cured several cases of Graves's disease; even the wearing of an abdominal belt in a case of visceroptosis has effected a cure.

A number of cases have followed acute infectious diseases when resistance to bacterial infection is low. Foci of infection in the mouth or nasopharynx were discovered in 70 per cent. of the present series of cases of Graves's disease.

In Graves's disease there is an increase in the number of lymphocytes around the adenoid portions of the thyroid and in the lymphocytic aggregates at the hilum, together with a general increase in the

Sino-auricular Block: References.

(Continued from previous page.)

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lymphoid tissue of the spleen, parathyroids, liver, kidneys, bone-marrow, and intestines. This may fairly be considered a reaction to bacterial infection.

There are two main objections to this theory. The first one is that the diminution of HCl secretion occurs in the course of the disease, the second that the achylorhydria in 60 per cent. of cases is only an apparent one. In many cases, therefore, the achlorhydria cannot be considered as a predisposing cause of hyperthyroidism, although, at a later stage of the disease, it may enable toxins to be elaborated in the intestinal tract which will help to maintain the state of thyroid toxæmia.

The third explanation is that the absence of HCl is due to regurgitation of duodenal contents. In many of the cases a very great frequency of occurrence of bile is noted, and in 60 per cent. of cases of achlorhydria bile was found in more than half the samples. These cases also showed a relatively high total acidity. Total chlorides were estimated in four cases of achlorhydria; in two of these the value was low and the chloride curve ran a more or less horizontal line, whilst in the other two the chlorides were found to be high and the curve to be of the climbing type, suggesting duodenal regurgitation. A chloride estimation was also made on four cases of hypochlorhydria and on two cases of normal secretion, and in all these cases the high chloride values warranted some degree of duodenal regurgitation, which, in one or two cases, was very considerable indeed. It was also found that the presence of bile was a fair indication of duodenal regurgitation, as the total chlorides attained their highest values in those samples containing bile. Thus one may conclude that 60 per cent. of the cases of achlorhydria, found in Graves's disease, are apparent achlorhydrias due to duodenal regurgitation.

The rapid emptying of the stomach, found in Graves's disease, has already been noted. This hurrying of the gastric contents is in accordance with the hypermotility of the lower intestinal tract leading to diarrhœa, a very common symptom in Graves's disease. A patulous pylorus probably also accompanies the hypertonus of the stomach, and the two conditions, acting together, explain how duodenal contents may regurgitate in large amounts and give rise to an apparent achlorhydria or to an apparently low acid secretion.

The Sympathetic Factor in Gastric Function.

If a large number of achlorhydrias may be attributed to duodenal regurgitation, there still remain, however, 40 per cent. of cases requiring an explanation. As the number of true achlorhydria found in Graves's disease is five times the average incidence of achlorhydria in the normal person, it is suggested that the low or absent secretion of HCl in these cases may be caused by an inhibitory action due to overstimulation of the sympathetic system. To test this theory, the sympathetic systems of two cases of hyperchlorhydria were stimulated by injections of adrenalin and the effect on gastric secretion was noted.

The first was a case of dyspepsia of vagotonic type. A test-meal showed the HCl curve to be of the climbing type and reaching 90 (N/10 NaOH). Bile was present in 3 out of the 13 samples taken at quarter-hour intervals. Starch was still present at the end of the test—viz., three hours. A second test was made, and at the end of the first hour a subcutaneous injection of ℥ xv., 1 in 1000 adrenalin was given. The chart showed a surprising change. Following the injection of HCl curve dropped from 70 to nil. In a quarter of an hour the curve rose again as high as before, but at the end of the three hours fell very low and returned to zero. No starch was found after two and a half hours. Of the samples following the injection all but one contained bile.

Rather impressed by this but in some doubt whether the sympathetic stimulation was due to adrenalin or the prick of the needle, it was decided to treat a similar case with adrenalin continued over some time.

A patient with symptoms of duodenal ulcer was given a test-meal. The chart showed a high and climbing curve, the HCl reaching 88 (N/10 NaOH). To him were administered ℥ v. of 1 in 1000 adrenalin subcutaneously every four hours, until, after the fifteenth injection, there occurred abruptly, symptoms of sympathetic stimulation—to wit, tachycardia, palpitation, and tremor. Thereupon a second Rehfuss test was made. This showed hypochlorhydria. The HCl reached 23 (N/10 NaOH) as a maximum, the stomach emptied only 15 minutes sooner, and there was no alteration in the amount of bile, which was very small and occasional in both cases. It is interesting to record that, following the injections, the patient felt considerably better and was free from pain for several days.

If stimulation of the sympathetic causes this change in gastric function, then paralysis of the sympathetic should have the opposite effect. The drug best known to have such an action is nicotine. It has already been pointed out how smoking increases the secretion of HCl, and it was found interesting to make Rehfuss tests on six cases of post-encephalitic Parkinsonism undergoing prolonged nicotine treatment (administered hypodermically in doses varying between 1/30–1/5 gr.) in an attempt to reduce plastic tone. The tests were made before and after treatment. One case showed no change. The other five all showed an increase in HCl secretion. In one case the HCl rose from 60 (N/10 NaOH) to 110, after ten days of nicotine treatment, 1/5 gr. of the drug having been administered thrice daily.

There is a certain amount of evidence to show the part played by the sympathetic in gastric secretion. It is an accepted fact that the vagus and the sympathetic have an antagonistic effect on the motility of the stomach. It is reasonable to suppose that their effects (if any) on gastric secretion are opposite. Pavlov's [3] experiments have shown how secretion stops in frightened or enraged animals, presumably under strong sympathetic stimulation. R. Gaultier [1] has observed in the dog that section of the splanchnic nerve (sympathetic) always causes a pronounced hyperchlorhydria and that excision of the solar plexus has a similar effect. He concludes that the sympathetic, by means of the circulation, is an important factor in regulating the acid secretion of the stomach. Shortly before this, Shupfer [4] had drawn the same conclusion based on experiments which showed that section of the anterior and posterior roots of the fifth to the ninth dorsal segments (from which the sympathetic arises) caused a constant hyperchlorhydria.

In concluding, one may say that the low acid secretion and the achlorhydria, which have been nearly a constant feature in the present series of cases of Graves's disease, can be explained by a twofold mechanism. One, associated with overaction of the vagus, and causing both hastening of the gastric contents in passing through the stomach, and duodenal regurgitation. This would explain the cases of apparent achlorhydria. The other, by a direct inhibitory action of the sympathetic on hydrochloric acid secretion and causing a true achlorhydria.

Both the vagal and sympathetic types of achlorhydria may be ascribed to profound changes in the tone of the vagus and sympathetic nerves which are well known to occur in Graves's disease and which give rise to the other signs of hyperthyroidism.

Summary.

(1) Rehfuss tests were made on 50 cases of hyperthyroidism. (2) Of these, 22 showed achlorhydria, 15 hypochlorhydria, 13 normal or high normal chlorhydria. (3) The average duration of symptoms in achlorhydric cases was 2·9 years, in hypochlorhydric cases 1·1 years, in cases with normal secretion 0·5 year. This suggests that the diminution of HCl secretion occurs in the course of the disease, and is not a predisposing cause. (4) Of the cases of achlorhydria, 60 per cent. were due to duodenal regurgitation. (5) An explanation has been offered of the cases of true achlorhydria found in Graves's disease.

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DEVELOPMENT OF A TUMOUR (FIBRO-SARCOMA) AFTER INJECTION OF SALVARSAN.

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CHEMICAL irritants are relatively often found to be contributory causes in the formation of tumours, in most cases epithelial tumours (for example, skin-cancer), but also sarcomas. Arsenic, when introduced into the organism, is to some extent deposited in the skin, and this renders it probable that eventual changes are most likely to occur there. Thus we have the arsenic melanoses and hyperkeratoses following on long-continued administration of arsenic, and we find skin-cancer in consumers of arsenic. This was pointed out by Hutchinson (1887), who observed skin-cancer in patients with psoriasis, to whom arsenic had for years been administered per os. In order to investigate the question whether arsenic had really any tumour-producing power, Leitch and Kennaway [1] have fed rats and mice with food containing arsenic, but without any result. They then proceeded to paint the skin with arsenic (alcoholic solution of arsenite of potassium). Only in one out of many experiments did they observe after about 12 weeks the growth of a tumour, which proved to be a squamous-cell carcinoma, and there was also metastasis to the lung. The significance of chronic inflammations in the formation of tumours has also been recognised; most often epithelial tumours, although indubitable sarcomas, have also occurred.[2]

The whole matter may be regarded from the viewpoint of Virchow's theory of irritation, and if we in the case about to be described assume that the arsenic injected has played a part in the subsequent development of a tumour, then the following statement by Borst [3] is very much to the point: "One may hold that by chemical and other irritations chronic inflammatory and regenerative processes may be maintained, during which there will occur such changes in the character of the cells as will make them incline under certain circumstances to malignity."

Clinical History.

Female, aged 46, admitted to Drammen City Hospital, Norway, in October, 1925. Had an apical pulmonary affection eight years ago; in 1909 double salpingitis. In November, 1910, she was admitted to hospital suffering from syphilis, with a genital chancre and a maculo-papulous squamating exanthema. For this she was given on Dec. 31st an injection of the salvarsan preparation "Hata 606," 0·50 g. in the left interscapular region, whereupon the exanthema disappeared after a month. In the following year she was again admitted, suffering from mucous tubercles on the genitals and in the mouth, and was treated with mercury. On that occasion nothing was recorded respecting the site of the previous injection. She now states that after the injection 15 years ago she got a "lump" at the place of injection, which had continued without appreciable change until about a year ago, when after an injury it began to increase in size, and has since grown steadily, sometimes causing slight pain.

Condition on Admission.—Healthy appearance, lungs, heart, and urine normal. In the left interscapular region there is a well-defined, firm tumour, as large as a goose-egg, not tender to touch, and covered by normal, movable skin. The tumour can be moved slightly from side to side.

Operation.—On Oct. 22nd the tumour was removed by a longitudinal incision made through the fascia and muscle. It was surrounded by a fibrous capsule, so that it could be extracted apparently in its entirety. The wound healed rapidly. Nov. 25th: No sign of recurrence.

Pathological Report (Pathological Institute of the State Hospital, Prof. Francis Harbitz).—Ovoid tumour, 11 × 5 × 4 cm. in size, surrounded by a thin capsule, in part slightly adherent to surrounding connective tissue. The surface is somewhat uneven and the cut surface greyish-white and firm. At one point some necrosis. At one pole another tumour as large as a nut was found, separated from but immediately adjacent to the main tumour. Microscopical sections of the tumour at different places showed numerous, mostly long-shaped, connective tissue cells and a fibrillary intercellular substance. At some places the cells lay close together and showed atypical forms. At other places there are more regular, proliferating connective tissue cells of tumour-like nature. Section of the soft portion showed a more myxomatous connective tissue without atypical cells. Only slight infiltration of leucocytes, at many places none being seen. Diagnosis: Fibro-sarcoma.

Discussion.

"Hata 606" is the name first given to salvarsan, and it contains about 30 per cent. of arsenic. From the history of the case it was impossible to avoid the suggestion of an ætiological connexion between the intramuscular injection 15 years ago and the subsequent development of the tumour at the same spot. The tumour was, therefore, sent to the Pharmacological Institute of the University of Oslo, and was examined for arsenic by Prof. Poulsson with the following result.

There were small quantities of arsenic in the tumour. The examination was carried out by cutting out 50 g. of the central portion of the tumour with sterile scissors, destroying the organic substance by means of hydrochloric acid and chlorate of potassium, and otherwise proceeding in the usual manner. In the Marsh apparatus there appeared after some time a scanty coating with the appearance characteristic of arsenic, which on introduction of dry hydrogen sulphide assumed under gentle heat the yellow colour of arsenium sulphide.

In the normal human body arsenic is of constant occurrence in very small quantities, especially in the thyroid gland, in the skin and hair, being probably conveyed in the food. Gautier [4] estimates the total quantity of arsenic in the human body at 0·43 mg., 0·17 mg. being found in the thyroid gland. In the rest of the body, and mainly in skin and hair, there should thus remain about ¼ mg. of arsenic. In normal musculature Gautier and several other investigators found no arsenic.[5]

Prof. Poulsson states that, although no quantitative analysis was made, yet from the investigation made and from the distinctness of the test it may with certainty be assumed that the detected quantity of arsenic exceeds the amount normally present, otherwise, in the relatively small portion of tissue examined (50 g. of tumour substance), arsenic could hardly have been detected so distinctly by the method employed. As there was no evidence of the introduction of arsenic from other sources, it may be assumed that some of the arsenic injected must have remained at the place where the tumour afterwards appeared. What is therefore remarkable in the first place is the long time the arsenic has persisted locally. In Poulsson's "Pharmacology" it is stated that some of the salvarsan passes through the body unchanged, and appears as such in the urine from 5 to 30 minutes after intravenous or intramuscular injection, while some of it goes over to form unknown combinations. The main quantity is excreted in the course of the first few weeks, the remainder leaves the body slowly, so that the urine reacts to the arsenic test for several weeks; after arsenic poisoning for several months.

The next point of interest is the tumour itself. According to the patient's statement, an infiltrate remained at the point of injection for about 14 years, and, after a trauma (about which, however, there is room for doubt), it began to grow. The infiltrate itself probably implied a chronic reactive inflamma-

[1] A. Leitch and E. L. Kennaway: Experimental Production of Cancer by Arsenic, Brit. Med. Jour., 1922, ii., 1107.
[2] Francis Harbitz: Chronische und akute Entzündungen als Ursache für Sarkom, Acta Pathol. et Microbiol., Scandinavica, 1924, vol. i., fasc. 4, p. 438.
[3] Max Borst: Allgemeine Pathologie der Malignen Geschwülste, p. 71.
[4] Cit. from Poulsson's Pharmacology.
[5] In Biochemische Zeitschrift, 1925 (vol clxv., parts 4–6), *Irar Banz*, in an article entitled: "Der physiologische Arsengehalt des Harns und damit zusammenhängende Fragen," has exhaustively discussed the question of arsenic in the organism. He has partly refuted some of the older investigations, but makes it clear, however, that musculature (flesh), in comparison with most other kinds of tissue, is extremely poor in arsenic.

tion, and doubt might, therefore, be entertained whether the tumour was not of inflammatory nature. Judging from its clinical behaviour—its distinctly progressive growth, appearance, limitation by a capsule, as well as the whole microscopical picture with the scanty infiltration of leucocytes, localised only to some spots, it seems exceedingly probable that there has existed a genuine tumour, in this case mainly a fibroma, but at some places more of sarcomatous nature.

THE TITRATION OF SCARLET FEVER ANTITOXIN IN RABBITS.

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AND
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IT is generally admitted that one of the most urgent needs in connexion with recent work on scarlet fever is a method of titrating toxin and antitoxin by some means other than on human subjects. Up to now the only promise of an animal test has come from the researches on goats of Kirkbride and Wheeler,[1] but the work has not yet been generally confirmed and the method is complicated by many difficulties.

Many attempts have been made in the past to measure in various laboratory animals, particularly mice and rabbits, the protective value of antibacterial sera against living cultures of streptococci. The results of most of this work in our own and other workers' experience have been disappointing. It has been found, however, that rabbits could be killed with reasonable regularity by the intravenous injection of the "Dochez" streptococcus and certain other scarlet fever strains. If the rabbits were injected intravenously 4 to 6 hours previously with an adequate amount of scarlet fever antitoxin, death did not take place or was delayed beyond the sixth day. 10 c.cm. of a 20-hour tryptic digest broth culture of the *Streptococcus scarlatinæ*, given intravenously, killed in successive experiments 70 per cent. of 63 rabbits of medium weight within 48 hours and 92 per cent. within six days. 5 c.cm. of unconcentrated and 1 c.cm. or less of concentrated scarlet antitoxin protected the great majority of rabbits. The protected animals, which survived for a longer period than six days, almost always developed a purulent arthritis of one or more joints, from which a pure culture of the streptococcus could usually be obtained.

With sera other than streptococcal no protection was obtained; with various antistreptococcal sera, other than scarlatinal, from 17 to 29 per cent. of the rabbits were protected by doses of 5 c.cm. of serum. This group included unconcentrated sera prepared against streptococci of erysipelas, puerperal fever, and pyogenic infections. Seventeen rabbits were injected with 5 c.cm. of a serum prepared by immunisation with filtrates of a strain of *Streptococcus pyogenes*. Of these, 29 per cent. survived. This strain was isolated by Sir Frederick Andrewes from the septic finger of a nurse at St. Bartholomew's Hospital. It produced a toxin which gave a reaction indistinguishable from the Dick reaction in Dick-positive individuals, but no reaction in Dick-negative individuals; it had, therefore, a close antigenic relationship to the scarlet fever group of streptococci.

Having found that specific scarlet fever antitoxins could be distinguished from other sera, an attempt was made to compare scarlet fever antitoxins of different values as tested by the Schultz-Charlton and passive immunity methods. Three pairs of sera which had been placed by means of human tests in "order of merit" were compared. Of two unconcentrated sera, "A" was considered better than "B" on human tests. Serum "A" in a dose of 10 c.cm. turned 13 out of 14 "Dick-positive reactors" negative within 24 hours, and 0·2 c.cm. of a 1 in 500 dilution blanched the rashes of 7 out of 15 patients. Serum "B" turned none of 4 patients Dick-negative, and blanched poorly the rashes of 4 out of 15 patients. In the rabbit test 15 rabbits were injected with each of the two sera in corresponding doses—viz., 10 c.cm., 5 c.cm., and 1 c.cm. Ten of the rabbits in the "A" batch survived, but 5 only in the "B" batch.

The second pair of sera consisted of a concentrated batch, "D," and an unconcentrated, "E." By human tests it was found that with 2·5 c.cm. of serum "D," ten Dick-positive reactors became negative over night, and still gave a negative Dick test when retested on the twelfth day, whereas serum "E" in a dose of 10 c.cm. turned only 7 out of 10 patients negative. In the rabbit test the percentages of survivals were at every dose higher for serum "D" than for serum "E." A dose of 1 c.cm. of serum "D" saved all three rabbits injected, while it took 10 c.cm. of serum "E" to produce the same result. With a third pair of sera the same agreement between human and rabbit tests was found.

We have not yet had an opportunity of comparing sera known to be efficient in the treatment of scarlet fever with sera which proved unsatisfactory, though this is the crucial test of any method of titration.

In analysing these results, it was obviously most important to decide whether the protection of the rabbits was due to antitoxin per se, or to some other protective antibody produced in the horse in response to immunisation.

The following observations have a bearing on this question: (1) Many of the sera were experimentally made by injecting horses with bacteria-free filtrates of young cultures of streptococci, and were therefore as purely antitoxic as could be prepared. (2) The serum of rabbits highly immunised against washed (toxin free) streptococci, though rich in agglutinins, had no protective value. (3) Human convalescent serum had a small but definite protective value. (4) The protective power of antitoxic sera against culture was lost if the serum had previously been treated with an adequate amount of toxin. (5) Scarlet fever toxin, when given intravenously in sufficiently large quantities, killed 80 to 100 per cent. of rabbits. Scarlet fever antitoxin protected rabbits from death due to toxin, while normal horse serum and concentreated diphtheria antitoxin were without protective value. These observations possibly provide a means of titrating scarlet fever toxin and antitoxin without the use of culture.

These results, further details of which will be published at a later date, in conjunction with the agreement obtained with human tests, suggest, if they do not prove, that the test is a measure of "antitoxin" per se.

It may be added that though scarlet fever antitoxin protects rabbits against hæmolytic streptococci from cases of scarlet fever, it also protects against the septicæmia due to certain other hæmolytic strains which have no obvious connexion with scarlet fever. It is not clear at this stage, therefore, to what extent the test can be used conversely to identify the scarlet fever streptococcus. Before this question can be answered it would be necessary to have much more information about the immunological relationships between streptococci of the hæmolytic group and their toxins than is yet forthcoming.

Summary.

(1) Rabbits can be killed with considerable regularity by intravenous injections of broth cultures of the *Streptococcus scarlatinæ*.

(2) A test is described by means of which scarlet antitoxic sera can be compared among themselves

[1] Kirkbride, Mary B., and Wheeler, Mary W.: Proc. Soc. Exper. Biol. and Med., 1924, xxii., 86.

and distinguished from other sera. Scarlet fever antitoxin protects rabbits against the more acute phase of the septicæmia due to the streptococcus. Later, many of the protected animals develop arthritis and other manifestations of subacute infection.

(3) The test is a quantitative one; "good" sera can be distinguished from "poor."

(4) In the case of three pairs of antitoxic sera differences were detected by the rabbit test corresponding to differences on human test.

(5) The method, if confirmed in further work, may provide a means of titrating scarlet fever antitoxic serum in the laboratory.

PULMONARY TUBERCULOSIS.

A SIMPLE PREVENTIVE.

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SEVEN years ago I began to investigate the incidence of pulmonary tuberculosis in families exposed to infection, trying to find the principle of selection with a view to the prevention of the disease. I began by assuming that every case of pulmonary tuberculosis was as certainly the result of infection as every case of measles. Next, that if several persons are equally exposed to the same infection under the same conditions for the same time, their escape or infection must depend on the resistance of the individual. And the task I set myself was to find the secret of that resistance.

My opportunities have been only those of a country practitioner in charge of a sanatorium for boys with about 40 beds. I chose large families (to avoid freak results) and small houses (to ensure fairly equal exposure of each member). It is, of course, impossible that all should inhale the same number of bacilli per breath or per day, but it is sufficient for our purpose that they all live and sleep at home, healthy and infected mingling in the ordinary intercourse of daily life. They will all inhale the same strains of bacilli mixed in the same proportions. Whether those bacilli are many or few matters not, since everyone must breathe the air in that small home. The attack is the same. The conditions under which they have to meet it are the same. All the countless factors of ventilation, sunlight, good or bad food, cleanliness, careful or careless coughing and spitting, &c., need not be taken into account. They were the same for all. And the hereditary resistance of the family, or at any rate of the children, may be assumed to be the same. Everyone starts fair. It is, in fact, a classic race and not a handicap.

Search for Some Common Factor.

After some years of such a test we need only inquire into the health of each member to know which have the better resistance. I wished to find some common factor which all or most of the survivors possessed and all or most of the infected lacked. None of the usual ætiological factors seemed to fit, though any one of them would account for a case here and there. Nothing was of general application until I began to ask a very simple question—six words only—"Do you eat fat—or not?" I found that most of the healthy survivors had always done so, while the great bulk of the infected, the dead, and the dying had had a lifelong dislike for fat and had avoided it as far as possible all their lives. In family after family I found this trivial peculiarity dominating the situation, brushing aside other influences, forming the dividing line between healthy and infected, living and dead. In many families all the fat-eaters had escaped, while all the fat-shy (to use a convenient expression) had become infected. In some the only fat-eater was the only person to escape. In others the only fat-avoider was the only victim. I began to see daylight.

That these were no mere coincidences soon became apparent, for I found no such coincidences in the opposite direction. Exceptions and discrepancies occurred and often, but I have not yet found a single family where the usual position has been completely reversed—i.e., where all the fat-eaters had become casualties and all the fat-shy remained well and healthy. It must be understood that it is a tendency only, although a very strong one. The fat-eater has no absolute immunity; the fat-shy are not necessarily doomed, but the probability is always in that direction, and in the long run probabilities will tell. Perhaps the best way to put it is this: "When several persons are equally exposed to infection, those who habitually eat animal fat will probably escape—but may not, while those who avoid fat may escape—but probably will not."

Some Illustrative Cases.

I have investigated more than 40 families fulfilling the conditions I have suggested. Space forbids my publishing more than a few records. I would assure my readers that all these families were free from tuberculosis (as far as is known) until they were exposed to infection. And I would ask them to remember that these records are by no means exceptional—merely striking examples of a general rule.

CASE 1.—The family of father, mother, and seven children lived in a five-roomed cottage in a Hampshire village. They were exposed to infection by another son who came home in 1920 after war service in Russia and soon after developed a persistent cough, the nature of which was not discovered until one of the daughters had become infected. From that time to this there have never been less than two positive cases in that home. Here they are as they would appear in the usual family history.

Mother, 57, P.T. pos. — Father, 59, alive and well.

Sons.	Daughters.
Son, 30, alive and well.	*Daughter, 21, died P.T. 1921.*
Son, 28, died P.T. 1922.	*Daughter, 17, died P.T. 1924.*
Son, 22, alive and well.	*Daughter, 29, P.T. pos. advanced.*
**Son, 11, tub. ankle.*	
Son, 12, alive and well.	

A mere casualty list telling us very little.

The son of 28 seems to have been the introducer of infection. Put him on one side and divide the rest into fat-eaters and fat-shy. This is best done by asking the mother, an expert witness on this matter, whose memory rarely fails. Put them into parallel columns and a flood of light is thrown upon a very dark situation.

FAT-EATERS.	FAT-SHY.
Father, 59, alive and well.	*Mother, 59, P.T. pos.*
Son, 30, alive and well.	*Daughter, 21, died P.T. 1921.*
	Daughter, 17, died P.T. 1924.
	Daughter, 29, P.T. pos. advanced.
	**Son, 11, tub. ankle.*
	Son, 12, alive and well.

The son of 22 is away from home and I could get no reliable history of his fat habits. He is almost certainly healthy because he is serving in the Marines.

CASE 2.—This family moved into a badly infected house in (I think) 1920. Here is their present condition.

FAT-EATERS.	FAT-SHY.
Father, alive and well.	*Mother, dying P.T.*
Son, 18, alive and well.	*Boy, 23, died P.T. 1926.*
Daughter, 14, alive and well.	*Girl, 18, died P.T. 1925.*
Son, 9, alive and well.	*Girl, 17, died P.T. 1925.*
	Boy, 13, early P.T.
	Girl, 24, alive and well.

Exceptions can often be explained by careful inquiries into the domestic details, especially as regards sleeping accommodation. In this case the fat-shy girl of 24 who has escaped so far has all along shared a room with the healthy girl of 14. This little bit of shelter may have helped her.

* Cases of bone and joint tuberculosis are inserted for completeness. I doubt if they follow the usual rule, at any rate, with the same frequency.

CASE 3.—Infection was by the father, an old-standing positive case.

FAT-EATERS.	FAT-SHY.
Mother, 60, alive and well.	*Son, 25, died P.T. 1917.*
Daughter, 33, alive and well.	*Daughter, 25, died P.T. 1922.*
	Daughter, 21, died P.T. 1923.
	Son, 20, P.T. pos. advanced.
	Daughter, 35, doubtful.

The daughter of 35 is married and living at a distance. She is said to be "delicate" and has been refused by an insurance company, but possibly on her family history.

Now in these three families there were many of the fat-shy, and so there were many casualties. Introducing infection here is like starting a fire in a timber yard. There is plenty of inflammable material lying about and too often the conflagration only comes to an end for lack of fuel. It is interesting to notice how closely a bad family history is associated with the presence of infection and many fat-shy members. Of course, a spotless record may mean nothing more than absence of infection, just as a saint may be greatly indebted to his freedom from temptation. But potentially a family of this sort is always weak and their resistance crumples up as soon as severe and continuous infection has to be faced. Now, by way of contrast, here are some families where the fat-shy are few.

CASE 4.—Infection was by a lodger.

FAT-EATERS.	FAT-SHY.
Mother, alive and well.	*Boy, 11, early P.T.*
Father alive and well.	*Boy, 10, early P.T.*
Boy, alive and well.	
Girl, alive and well.	
Girl, alive and well.	

CASE 5.

FAT-EATERS.	FAT-SHY.
Father, alive and well.	*Boy, 14, P.T.*
Mother, alive and well.	
Ten children alive and well.	

This family had a floor in a tenement house, and on the floor below lived a consumptive woman. There was little or no intervisiting, but they shared a lavatory, and, of course, the stairs and passages were common property. With such slight opportunities for infection one might be sure that only a fat-shy person could come to harm. And so it turned out.

CASE 6 is similar, except that the mother is the infecting agent. The father and eight children were exposed and again the only fat-shy person is singled out in uncanny fashion.

FAT-EATERS.	FAT-SHY.
Father, alive and well.	*Boy, 12, P.T.*
Seven children, alive and well.	

That these things are chance common sense forbids. I have chosen clear-cut cases for demonstration, of which I have many more, but it must not be thought that all histories are clear cut. Accidents will happen, even to fat-eaters, but it will be found that in nearly every case their percentage of casualties is far below that of the fat-shy.

Fat-eaters and Fat-avoiders.

The classification is easy enough. We all have a certain liking or disliking for animal fat, which if uncontrolled determines our habits, and a direct question usually brings a direct answer. The fat-eater eats all forms of fat, generally because he likes it, sometimes to avoid waste, or bad manners, and the like. Many prefer fat to lean and eat large quantities of it, but I have never been able to trace in them any advantage over the normal fat-eater. The fat-shy sometimes avoid all forms, but often make exceptions, the common ones being butter, "crisp" (i.e., overcooked) fat, ham and bacon, and dripping. People who eat a few fats only are clearly fat-shy and must be so classed. They do not eat enough for their protection. Especially is this the case with ham and bacon, which, oddly enough, few of them object to, and which seem to have no protective effect whatever. That these fats are deficient in vitamins is suggestive. All the fat-shy agree in their dislike of mutton and beef fat, and from this one might think that these are the important fats for our purpose, but clearly it may not be so at all, but just that when only a few fats are eaten and the common ones rejected the total amount is too small or taken at too long intervals. That everyone can eat fat if he chooses is certain. Of some 300 admissions to Heath End† 80 per cent. had avoided fat all their lives. Nevertheless, they all ate it "fair and square, as it comes," when the importance of so doing was frankly told them, and I can only recall one case (a hopelessly over-indulged child) where we had any difficulty.

A Different Angle.

By inquiring among patients at dispensaries and elsewhere I found that the large majority were fat-shy, and further that the infection to which their resistance had yielded was often very slight and occasional, whereas the fat-eater seemed to require sudden exposure to many bacilli, usually continuing day after day for months. Histories of infection are merely estimations of probabilities and prove nothing, but hearing a good many gave me that impression.

The fat-eater cannot suddenly share a bed with a consumptive, nor plunge into badly infected lodgings, nor stand the introduction into his small office of a clerk who coughs incessantly and proceeds to close every possible crack to avoid draughts. But the fat-shy cannot meet an infectious friend once a week at a club, nor teach in a large, airy school-room where an infectious child came for just three days. And many of the fat-shy were apparently exposed to quite occasional risk by their occupation. Now we have seen the fat-eater exposed to very severe infection in the home and remaining healthy. Home infection is nearly always gradual, the air slowly becoming more and more laden with bacilli. Most fat-eaters seem to be infected outside the home where sudden severe exposure is more likely, and it seemed that this element of suddenness was all-important. The fat-eater is apparently immune to moderate doses of bacilli and eventually to very large ones provided that the increase is fairly gradual. I made a rough working hypothesis.

A Rough Working Hypothesis.

We may, I think, regard a family of mixed fat-eaters and fat-shy as patients who are about to have a vaccine treatment, and we may think of fat as in some way very helpful, if not essential, to the formation of antibodies. The fat-shy, with their low resistance, must be very cautiously dealt with; a very small initial dose, and carefully increased subsequent doses. In like manner they can inhale a very few bacilli at first and very slowly and gradually deal with more and more.

With the fat-eater liberties can be taken. His higher resistance allows a bigger initial dose and much less care about the subsequent doses. In the same way he can inhale with impunity a comparatively large dose of tubercle bacilli and increase the number much more carelessly. Doses which would be fatal to the other are positively beneficial to him, helping him to build up an ever-increasing resistance. He can stand anything in reason—anything, that is, but a series of overwhelming doses to start with. Exceptions to the general rule must occur—it cannot be otherwise—the fat-shy may have very good luck or the fat-eater very bad luck. But it is to the last degree unlikely that all the fat-eaters in a large family would meet with such an extraordinary series of disasters as to break down all their resistances, while at the same time all the fat-shy would have such astonishing luck as to receive exactly the right immunising doses throughout.

I tested this theory by applying it to marriage: (*a*) to a person already infectious, and (*b*) to a healthy person who afterwards developed pulmonary tuber-

† That this is an abnormal percentage is shown by a rough census in the elementary schools of Aldershot among children of about the same ages and the same social class. It shows a small majority for the fat-eaters, 950 to 850.

culosis. Of the first class I have no cases of my own. Happily they are uncommon now. But Sir Herman Weber's series, where nine husbands tuberculous before marriage lost 18 wives, are suggestive. It is probable that some of the 18 were fat-eaters and others fat-shy, but all alike became infected.

Looking through my small collection of cases of the second class I found that of 34 fat-eaters in this position only one became infected, while of six fat-shy persons four developed the disease.

Prevention.

We have seen the fat-eater asserting his superiority over his fat-shy brother in different ways from different angles. Like the arithmetical hero "A," he wins every contest easily. He has a defence good enough for ordinary needs, and if escape is possible he does escape. Only when he makes impossible demands upon his resistance does it fail him.

That everyone can eat fat is certain, and that the fat-eater by choice and the fat-eater by persuasion are equally protected (which has been doubted) the following examples clearly show. In each case the circumstances were parallel. The father was dying of pulmonary tuberculosis, they were very poor, and the mother tried to persuade her children to eat fat for economy's sake. It is evident that the result depends on her firmness and not at all on a natural taste for fat.

First we have a total failure. The children refused to touch it. They hid it under their plates or in their pockets. All became infected while the mother, who ate their leavings, escaped.

CASE 7.

FAT-EATER.	FAT-SHY.
Mother, alive and well.	*Boy, 15, P.T.* *Girl, 16, tub. hip.* *Boy, 13, P.T.* *Boy, 12, P.T.*

In CASE 8 the mother ate fat herself and persuaded four out of her five children to do the same. I believe that none liked it. The only fat avoider was the only one to show signs.

FAT-EATERS.	FAT-SHY.
Mother, alive and well.	*Boy, 13, P.T.*
Boy, alive and well.	
Boy, alive and well.	
Girl, alive and well.	
Boy, alive and well.	

In CASE 9 the mother was very firm and sensible. Most of the children heartily disliked fat, but they did as they were told, and here is the result, six years after the father's death.

FAT-EATERS.	FAT-SHY.
Mother, alive and well.	None.
Boy, 19, alive and well.	
Girl, 16, alive and well.	
Girl, 12, alive and well.	
Boy, 11, alive and well.	
Boy, 10, alive and well.	

In CASE 10 the same result was brought about by a lucky accident. The mother hit upon the idea of feeding the whole family on suet pudding, because it was cheap and nourishing. It formed their staple food nearly every day. She and her nine children all escaped.

My own small experience is the same. For six years in every home where I have had a case of pulmonary tuberculosis I have strongly advised the mother to insist upon everyone eating fat and to give them liberal and frequent suet. I have no failures to record. In no home where this has been done have any further cases been brought to my notice.

There is, I think, every reason to hope that a wider knowledge of these simple facts among the general public may lead to a great diminution of pulmonary tuberculosis. At present we are dependent for our safety on the intelligence and the goodwill of the infectious person. We exhort him to protect us. Here is a simple way of protecting ourselves, so easily, so effectively, and without the expenditure of an extra halfpenny either by the individual or by the community. And if I have been able to help in that direction—why, that is the whole object of this paper.

OBSERVATIONS ON PELLAGRA IN NYASALAND.

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PELLAGRA is not a disease of recent origin, for "Strambio finds that some of the symptoms mentioned in Hippocrates may be those of pellagra." It is actually stated by some that St. Francis of Assisi probably suffered from the disease. In 1578 the disease was probably known as "Pellarella," but Gaspar Casal, in 1735, was the first to recognise that the gastro-intestinal, cutaneous, and mental symptoms exhibited by the sufferers constituted a clinical entity. In 1872 Lombroso began to study pellagra, and continued to do so until he died in 1909. Sambon commenced his work on the disease in 1905.

Pellagra was first discovered to be present in Nyasaland by Stannus in 1910; its presence was again commented on by Milne-Tough in 1922. Pellagra is prevalent practically all over the world; it occurs in both flat and hilly districts, and the cases are most numerous near moving water.

There are three main theories as to the cause of the disease: 1. The deficiency theory, which states that pellagra is due to the absence of a nitrogenous complex from the food. 2. The maize theory, which states that the disease is produced by eating damaged or diseased maize. 3. The parasitic theory, which states that the disease is due to infection with some living organism.

Symptoms and Course.

In short, the symptoms and signs of pellagra are: 1. Langour and debility, dyspepsia, and diarrhœa. 2. Erythema of the face, back, arms, hands, chest, and legs. 3. Improvements occur, followed by exacerbations, until, in the course of a few years, cerebro-spinal symptoms develop with paralysis, spastic gait, melancholia. 4. Cachexia results. The duration of the disease extends to 10, or, perhaps, 15 years.

The following data have been obtained from observation of the pellagrins in the Central Prison Hospital, Zomba, and from cases occurring in the general population. These data support the following opinions:—

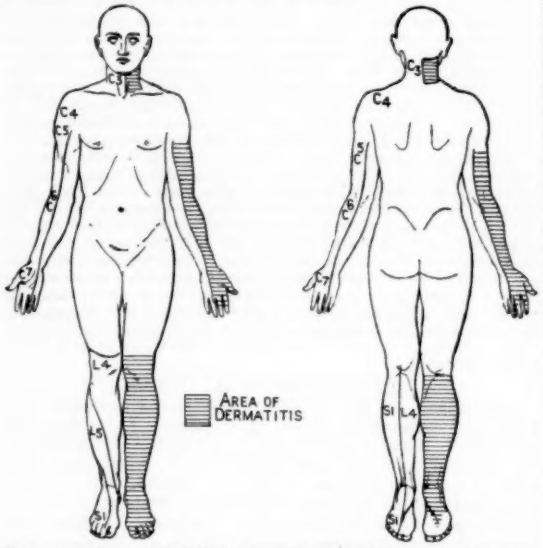
1. Pellagra is not a disease confined in Nyasaland solely to prisoners, as was previously thought, but occurs with comparative frequency amongst the general population. Natives have actually commenced to undergo their sentences at the Central Prison with the disease already well marked. Several cases have occurred in native soldiers of the King's African Rifles, and in the general population.

2. Pellagra is not a disease which is caused solely by diet, because if that were so, there is no reason why the cases should not be more numerous in the Central Prison, where all prisoners receive diet of both the same quality and quantity; also, it appears that in certain British asylums the disease has become endemic, and in such every year a number of fresh cases are reported. G. A. Watson, in the Ninth Annual Report of the Board of Control for the Year 1922, describes the outbreak in the Lancashire County Asylum, Rainhill, during the years 1913 to 1922. "From 1913 to 1918 inclusive 36 definite cases were noted, though there were several others of central neuritis with all the features of pellagra except the rash. In 1919–20 no further cases were reported, and the survivors of previous years showed no recurrences. In 1921 there was only one case, but in 1922 a severe outbreak occurred, 14 new cases being recorded. The majority of these had been in the institute for a considerable time, and, therefore, the adequacy of the diet was carefully investigated. It was found in 1922, the year of the severe outbreak, the diet was more generous and more varied than it had been in any previous year, even before the war."

3. It would appear that pellagra is a disease due to toxic absorption producing certain changes in the nervous system, leading to a neuritis of certain peripheral nerves. This neuritis produces trophic changes in the areas of the skin supplied by these nerves, with the result that the skin becomes dry and scaly from interference with its nutrition. These trophic lesions of the skin appear most marked on those parts of the body which are exposed to sunlight, but

some cases have been seen with well-marked skin signs on the scrotum and buttocks.

Usually, however, the skin lesions were most prominent in the skin supplied by the following nerves:—Neck: second, third, and fourth cervical; arms: fifth, sixth, and seventh cervical; legs: fourth and fifth lumbar and first sacral. The distribution of the dermatitis was absolutely symmetrical on both sides of the body.



Diagrams showing distribution of the dermatitis, and cutaneous nerves.

Resemblances to Myxœdema.

From these observations it seems that the toxin of pellagra produces changes in the thyroid gland, leading to an insufficiency of thyroxin being secreted, with the result that pellagra in some respects resembles myxœdema.

Myxœdema.	Pellagra.
Skin thickened and rough.	Skin thickened and rough.
Slight œdema sometimes present.	Slight œdema.
Skin dry and scaly.	Skin dry and scaly.
Tongue swollen.	Tongue sometimes swollen.
Mental dullness and apathy.	Mental dullness and apathy frequent.

Another observer, G. A. Watson, in the Annual Report of the Board of Control for 1925, mentions a case which was first diagnosed as myxœdema and later developed a typical pellagrous dermatitis and died. On post-mortem examination the thyroid gland was found to be practically absent. W. Susman, writing in the *Edinburgh Medical Journal*, February, 1926, gives an account of the morbid anatomy and histology of two cases of pellagra, in which the thyroid gland was generally fibrosed. He concludes that the oldest lesion was in the thyroid.

Treatment.

In my series of cases the administration of thyroid gland tablets (2 gr.) daily produced a rapid improvement in these pellagrins, some of whom had very severe skin lesions, the administration of the tablets caused a complete disappearance of the skin trouble in a few days (average about 10 to 15 days), and the patients felt physically improved and seemed mentally improved. Out of over 100 pellagrins treated by this method in the year 1924, only eight had any recurrence of the condition during the year 1925. Because in pellagra there is an achlorhydria, the administration of acid hydrochlor. dilutum in 5-minim doses three times daily was tried, but the condition of the patients undergoing this treatment remained unaltered. Arsenical mixtures did not produce any alteration of the condition, and after observing the results of these three treatments, the thyroid treatment has been adopted as a routine, as giving the most favourable results in the cases at the Central Prison, Zomba.

Ætiology.

Pellagra is, apparently, due to some obscure toxin, probably microbic or parasitic in origin. However, many of the cases in the Central Prison, Zomba, have been subjects of ankylostomiasis or bilharzia or a combination of the two conditions. It is known that these two intestinal parasites are capable of producing a profound anæmia, resembling pernicious anæmia, and it is known that in the later stages of pernicious anæmia changes take place in the nervous system which may lead to subacute and combined sclerosis of the cord; therefore it is not difficult to regard the course of pellagra as being due to the following:—

1. Infection of the individual with some parasite or micro-organism. 2. Formation of a toxin producing: (*a*) changes in thyroid gland; (*b*) anæmia. Forty blood examinations were made, and all cases had a reduction in the number of red cells, varying from 500,000 to 1,000,000. The percentage hæmoglobin varied between 40 and 70, and a marked eosinophilia was present in most cases; (*c*) changes in nervous system leading to peripheral neuritis, melancholia; (*d*) achlorhydria, &c.; (*e*) nephritis.

From this observation it is apparent that there is in pellagra: 1. A deficiency in thyroid secretion. 2. A neuritis of certain nerves in preference to others. 3. Skin lesions corresponding to the cutaneous distribution of those nerves.

The above observations were made during the years 1924 and 1925, when all the prisoners were on a uniform diet, which consisted chiefly of rice or maize meal, with fish or meat, peas, beans, nuts, fresh vegetables, and salt, giving an average food value of about 3000 calories per person per diem.

In conclusion, I wish to thank Dr. F. E. Whitehead, Director of the Nyasaland Medical Service, for his permission to publish this article.

Clinical and Laboratory Notes.

A CASE OF HERNIA THROUGH THE TRANSVERSE MESOCOLON.

BY S. T. IRWIN, M.CH. BELF., F.R.C.S. EDIN.,
SURGEON TO THE ROYAL VICTORIA HOSPITAL, BELFAST.

THE following case of hernia of the whole small intestine through the transverse mesocolon, following gastro-enterostomy, is, I think, of some rarity.

In September, 1926, I was asked to see a woman aged 30 who had had a gastro-enterostomy for gastric ulcer seven years before. After the operation the patient had been very ill, the main symptom being an extreme degree of vomiting with prostration. She made a very slow convalescence and had, indeed, never been quite well since the operation. For the last few months she had been suffering from pain associated with diarrhœa almost immediately after food. There was no passage of blood by the rectum. She could take only a very small quantity of food at a time owing to a feeling of fullness, and though there was little actual vomiting, the patient almost constantly felt sick and had lost a stone and a half in weight. About three years ago she had an attack of very severe pain and from that time onwards her sufferings had been accentuated.

On examination the patient was pale, drawn, and emaciated. The abdomen was retracted and generally tender. No mass could be felt and there was no localised point of tenderness. Rectal examination was negative. The patient's temperature was normal, but the pulse ran between 100 and 120. X ray examination was recommended, and Dr. F. P. Montgomery reported considerable irregularity and puckering around the mouth of the stoma and extreme hypermotility of the meal; a suggestion was made that a gastrojejunal ulcer might be present. On later examination of the abdomen visible peristalsis in the small intestine was noticed and a provisional diagnosis of obstruction at the seat of a tuberculous ulcer near the lower end of the ileum was made.

Operation was advised and was performed on Sept. 25th. On the abdomen being opened a large mass of distended

small intestine presented, and it was only with difficulty that its limits could be identified. It seemed at first that the small intestine was adherent to the front of the transverse colon. Further examination revealed the fact that the whole of the small intestine had passed through the opening in the transverse mesocolon which had been used for the anastomosis. It had then passed through a slit in the gastrocolic omentum. The opening was comparatively free and the small intestine was easily reduced. After the small intestine had been withdrawn the opening in the gastrocolic omentum was closed and the edge of the opening in the transverse mesocolon was sutured to the gastro-enterostomy junction. Owing to gross dilatation of the duodenum and the presence of a long loop of jejunum an entero-anastomosis was also done. Operation was well borne and convalescence uneventful.

At the end of November the patient reported that she had been quite well since the operation; she takes most kinds of food without discomfort, but owing to lack of chewing teeth has avoided red meats. The gain in weight has been about one and a half stones.

I have only once before seen a hernia through the opening in the transverse mesocolon, and that was in one of the early cases of gastro-enterostomy done in Belfast about 20 years ago. This patient died of acute intestinal obstruction. The condition is now rare owing to the universal practice of suturing the transverse mesocolon to the stomach in the neighbourhood of the anastomosis. The interest in the present case arises from: (1) the extent of the hernia; (2) the difficulty in determining at what stage in the patient's post-operative history the hernia occurred; (3) the fortuitous circumstance which allowed the small intestine to pass forwards through a slit in the gastrocolic omentum, thus preventing an accumulation of small intestine in the lesser sac; (4) the fact that the patient recovered from what under ordinary circumstances would have been a strangulated internal hernia.

A CASE OF BRANCHIAL CYST.

BY J. W. THOMSON, M.B., C.M. ABERD.,
SURGEON TO CLAYTON HOSPITAL, WAKEFIELD.

THE following case of branchial cyst presented some unusual features.

A man, aged 35, was sent to the ear and throat department of the Wakefield Hospital in July, 1925, with a suggestion that he was suffering from tuberculous disease of the larynx. Examination proving negative he was referred to me.

History.—In July, 1924, he first noticed a swelling in the left side of the neck. It gradually increased in size until it became as large as half a cricket ball. At this stage he had pain along the alveolar margin under the lobule of the ear and under the left shoulder, and headache. The swelling and pain disappeared after a sudden discharge from the mouth of a yellowish jelly-like substance. There were several such occurrences between this date and the end of the year. In January, 1925, the swelling was associated with huskiness of the voice. In March, 1925, he became an out-patient at another institution, from which it has been ascertained that there was fixation of the left vocal cord and that X ray examination of the chest for tuberculous disease was negative. His condition continued to deteriorate. The intervals between the attacks became shorter, the discharge was redder, the pain was more severe, and, when the swelling was at its height, dysphagia, dyspnœa, and aphonia completed the picture of misery.

Examination.—The patient was pale and thin and dejected and his voice was hoarse. There was a somewhat tense swelling the size of a tangerine orange on the left side of the neck about the level of the upper border of the thyroid cartilage. The skin was not involved and the swelling was not translucent. There was fluctuation and the outer border was overlapped by the sternomastoid muscle.

Diagnosis.—Whilst branchial cysts must be differentiated from tuberculous glands, cystic hygromata and several other conditions, the history of this case made it probable that this was a branchial cyst.

Operation.—The cyst had ruptured on the previous day just before admission to hospital so that it was not possible to obtain a specimen of the fluid, and the outline of the neck was normal, showing no trace of any swelling. An ample transverse incision revealed a flaccid sac under the deep fascia. It was easily freed from the sternomastoid and the great vessels, and as it passed inwards it was detached from the left lamella of the larynx and the greater cornu of the hyoid bone. From these attachments the narrowing sac passed backwards and inwards to the lateral wall of the pharynx. The opening into the pharynx admitted the index-finger. The dissection here became difficult, owing to the depth of the wound and the firm attachment of the cyst to surrounding structures, and somewhat dangerous from proximity to the larynx, and I was not satisfied with its thoroughness. The cyst did not pass between the external and internal carotids, nor did it appear to thin the sternomastoid. The wound was packed and the following day some of the packing appeared in the pharynx. Subsequently a tampon drain was used. The patient was discharged on August 12th, 1925. Two months afterwards he was alert and vigorous and could, by some manipulation of the cervical muscle, express from the wound a drop or two of seropurulent fluid. His voice had lost its hoarseness. December, 1926: the external wound is healed and there is no swelling. He is in good health, but there is still some slight discharge of fluid from the mouth at varying intervals.

Pathological Report.—The epithelial lining is very irregular both as regards the appearance of the cells and the number of layers of cells. The number of layers varies from four or five more or less cylindrical cells, particularly where the cyst wall is much folded, to only one layer of cubical cells in other places. In many places the epithelium is not well defined from the underlying tissue. The wall is composed of fibrous tissue for the most part very loose in structure and containing many blood-vessels. This tissue on the outer side penetrates irregularly among the surrounding muscle-fibres, so that there is no definite outer limit to the cyst. There are one or two small collections of lymphoid tissue present.

Discussion.

According to E. Wyllis Andrews [1] there are five forms of branchial cysts or fistulæ: (1) Complete branchial fistulæ with outer and inner openings. (2) Incomplete external fistulæ with outer openings only. (3) Incomplete internal fistulæ with inner openings only. (4) Branchial cysts with no inner or outer opening. (5) Branchial dermoids. This case does not quite conform to any of these. Any portion of the cleft may be obliterated in such a manner as to form a cyst, or it may become obliterated at several sites, thus forming several cysts.[2]

Branchial cysts, which are situated near the skin, are lined with squamous epithelium and are of the nature of dermoid cysts. They contain an opaque fluid of striking similarity to tuberculous pus and microscopically they are found to contain cholesterol and squamous epithelium cells.[3] If deeply placed the cysts are lined with cylindrical cells and contain a glairy mucoid fluid. The latter seldom give rise to symptoms.

A CASE OF ACUTE LEUKÆMIA COMPLICATED BY SYPHILIS.

BY A. J. HAWE, M.B. LIVERP., D.T.M. & H., M.R.C.S. ENG.,
AND
F. S. PATERSON, M.B. EDIN., D.T.M. LIVERP.,
MEDICAL OFFICERS, WEST AFRICAN MEDICAL STAFF.

THE following case presents some points of interest. The association of lymphatic leukæmia with recently acquired syphilis, and the rapidly fatal exacerbation of symptoms after treatment with intravenous arsenic, are of unusual occurrence. The diagnosis, which was made some hours before the patient's death, was verified by post-mortem examination.

The patient, a male African, aged 34, was being treated for syphilis in the out-patient department of the Gold Coast Hospital. He attended the hospital with early syphilis on Sept. 14th, 1926, and received 0·3 g. of novarsenobillon intravenously. He returned 13 days later very ill and suffering from advanced anæmia, and asserted that all his symptoms dated from the injection of N.A.B.

Examination showed him to be profoundly anæmic, with blanched mucous membranes and bleeding gums, and very dyspnœic. There was advanced pyorrhœa alveolaris and the gums oozed blood and a little pus. The tongue was covered with a brown fur. Both eyes were discoloured with sub-conjunctival hæmorrhages and some jaundice was discovered on close examination. Moist sounds were audible in both

[1] Keen's Surgery, iii., 278. [2] Bickham's Operative Surg., iii., 699.
[3] Hamilton Bailey: British Journal of Surgery, 1922–23, x., 565

lungs and hæmic bruits were heard at both the base and apex of heart. The spleen was enlarged and was palpable as a hard mass extending for a hand's breadth below the costal margin. All the superficial glands were palpable, but were soft and not greatly enlarged. The temperature was 99·4° F., the pulse-rate was 100, and the respiration-rate 25. After suddenly vomiting some blood six hours after admission the patient died. The following results were obtained from samples of blood taken before death: Percentage of hæmoglobin, 35; red blood corpuscles, 2,300,000 per c.mm.; white blood corpuscles, 50,000. 97 per cent. of the white corpuscles were of the lymphocytic type. Poikilocytosis, anisocytosis, and diminution of pigment in the red cells were marked. There were neither red cells nor malarial parasites. The lymphocytes averaged 10 μ in diameter and were of a premature type, with large ovoid purple nucleus and a complete outer ring of blue protoplasm (Leishman's stain).

Post-mortem examination by Dr. W. A. Young on Sept. 28th. The lungs were congested but not consolidated. The myocardium, pericardium, and endocardium were spotted with petechial hæmorrhages; there was no valvular lesion of the heart. The spleen was enlarged, thickened, and congested with dark areas resembling "hæmorrhages" in the medulla. The liver was congested and had a fatty appearance. The internal glands were not enlarged. The kidneys showed hæmorrhages beneath the capsules, which stripped easily. The cortex and medulla were clearly defined, the cortex being pale and the medulla dark and striated, with conspicuous red lines. There were a few hæmorrhagic spots in the cortices. The bone-marrow was uniformly dark red. The stomach, when opened, displayed an oozing mucosa and dark black contents. There was a hard chancre on the glans penis. Sections were made of the liver, kidneys, and spleen, and smears taken from the bone-marrow. The bone-marrow smears stained badly but showed a big preponderance of lymphocytes. The spleen pulp showed an enormous number of lymphocytes and also thickened trabeculæ and evidence of blood destruction. No malarial parasites were seen. The liver was fatty and in both this organ and the kidneys there was an infiltration of lymphocytes.

The points which arose for consideration were the effect of the intravenous arsenic on the presumably already existing disease, and the possible part played by the *Treponema pallidum*. The onset of all the severe terminal symptoms after the injection of novarsenobillon seems to indicate that the drug precipitated death and caused the fatal exacerbation.

Our thanks are due to Dr. A. J. R. O'Brien, surgical specialist, into whose ward the case was admitted, and to the director of medical and sanitary services, Gold Coast, for permission to publish these notes.

Medical Societies.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

A MEETING of this Society was held at Leeds on Dec. 17th, when Mr. W. GOUGH, the President, delivered a valedictory address, after which Dr. D. DOUGAL (Manchester) described an

Unusual Diffuse Uterine Tumour.

The patient was a single woman aged 43, whose main symptom was hæmorrhage, which had been constant for about five months. Before this time she had had menorrhagia for about a year. She had very little pain. A diagnosis of uterine fibroid was made and on Oct. 25th, 1926, Dr. Dougal removed the uterus subtotally, together with the left appendage; the right ovary was left behind as the patient was very anxious not to have both ovaries removed. Recovery was uninterrupted and she was discharged within three weeks

The uterus was enlarged and globular, about the size of a two months' pregnancy, and very hard. It was not encapsuled, but had polypoid extensions into the cavity, and Dr. Dougal thought that the tumour was probably an adenomyoma becoming submucous, but on microscopical section no obvious glandular structures were seen. This seemed very unusual, but a description of a similar growth, written in 1919 by D. B. Casler, was later found.

The tumour was in the fundus of the uterus, slightly on the posterior aspect. It was a diffuse growth and consisted of fibro-muscular trabeculæ, among which were scattered islands of softer tissue. These islands projected from the surface on section and gave the tumour a very peculiar appearance. The cut surface had not the homogeneous cheesy appearance usually associated with sarcomata, and there was no cystic formation. The cavity of the uterus was occupied by a number of polypi pale in colour. These again did not suggest sarcoma. They consisted of tissue very similar to the endometrial stroma; there were many oval cells closely packed together, and at the inner part there was a good deal of blood extravasation. The polypi were covered by a single layer of columnar epithelium and no glands were to be seen. None of the cells were definitely of malignant type. Lining the unaffected parts of the endometrium the mucous membrane was normal but somewhat compressed, especially as it approached the polypoid formation. Further in the uterine wall islands of cellular tissue lay amidst the muscular bundles; here again the cells were of the same type, and there was no necrosis. The growth had seemingly pushed in among the muscular bundles and displaced them, or in places had actually destroyed them by compression. There were areas where the stromal tissue looked as though it were travelling along veins or lymphatics, but it was doubtful if it had done so. Nearer the serous surface some of the cellular spaces had a somewhat different appearance. In these, in addition to the ordinary stroma cells, there were a few lines of larger cells which appeared to be the remains of broken-down glands.

The tumour, said Dr. Dougal, was evidently either a sarcoma or a benign tumour of the endometrial stroma which had grown first into the wall of the uterus and later towards the cavity in the form of polypi. Casler's case had been of exactly similar type, and he had considered it to be an endometrioma without glands.

The PRESIDENT said that he thought that the tumour was probably an endometrioma.—Prof. M. H. PHILLIPS (Sheffield) said that on first examining the sections he had regarded the growth as a sarcoma, but he had come round to the view that it was an endometrioma.—Mr. W. W. KING (Sheffield) said that if endometrial stroma was invading the muscle the tumour should be described as a sarcoma.—It was decided to refer the specimen to the Manchester Pathological Subcommittee.

Mr. King then described two cases of

Concealed Accidental Hæmorrhage

with special reference to the histological condition of the muscle.

CASE 1.—A multipara, aged 33, eight months' pregnant, had had abdominal pain and bleeding for a week. She presented the typical picture of concealed accidental hæmorrhage; she was pale, she had a rapid pulse, and the uterus was hard and tender. There was no urine in the bladder. At operation the uterus was plum-coloured from effused blood. There was free blood in the peritoneal cavity and large hæmatomata in both broad ligaments. Hysterectomy was performed, but the patient died in a few hours from shock.

CASE 2.—An unmarried girl, aged 22, was not known to be pregnant until she was taken ill. She was thought to be in labour, as the cervix was dilating and there was a little hæmorrhage. The uterus was hard, but not tender. The pulse-rate was 80, but increased a few hours later. Jaundice was noted, and the uterus, though still hard, was not tender. A diagnosis of concealed accidental hæmorrhage was made. The bladder was empty and no urine had been passed for 12 hours. At operation the uterus was plum-coloured and there were large hæmatomata in the broad ligament, but no free blood in the peritoneal cavity. Cæsarean section was performed. The uterus contracted well, but the patient died an hour later from shock.

Histological examination of the uterine muscle in both cases showed that the muscle was quite healthy except for a few small areas which had apparently been cut off by hæmorrhage, and in which the fibres stained badly and the nuclei were indistinct. The myometrium was infiltrated with blood and the extravasation was most marked at the inner and outer surface. There was no evidence of permeation through the uterine wall, such as might have been expected if the blood had spread outwards from the cavity of the uterus. Thrombosed vessels were to be seen. In the first case leucocytes were present under the retroplacental hæmorrhage and around some of the vessels. They were apparently phagocytic rather than inflammatory in origin.

A uterus was also examined which had been removed from a woman who died shortly after an ordinary antepartum hæmorrhage. Naked-eye hæmorrhages could easily be seen on the surface and in the muscle. The histological appearance was identical with that of the other specimens except that

it was possible to demonstrate the actual rupture of a vein. This appeared to show, said Mr. King, that there was serious mechanical obstruction to the venous flow. The whole picture of the uteri, both to the naked eye and histologically, suggested the occlusion of the large vessels rather than a permeation of the blood through them as a result of damage to their endothelial lining. Young had noted the same fact, and postulated an intravascular clotting from some unknown cause. Morse explained the appearance of the uterus upon a theory of torsion of the whole uterus, and Pollock and others had noted extreme torsion of the uterus from left to right. Torsion of myomatous uteri was well known to occur, so that there was nothing impossible in a theory of torsion of the pregnant uterus. The greatest difficulty in accepting this explanation was the frequency of albuminuria at the time of hæmorrhage. There was no sufficient evidence that albuminuria often preceded accidental hæmorrhage, so it could not be causal. The condition was generally considered to be a manifestation of toxæmia, but if so it was different, as Whitridge Williams had said, from any of the ordinary types of pregnancy toxæmia. Young stated that he considered that the albuminuria was only the result of the autolysis of the separated placenta, but his theory was as yet unproved. Hofbauer had produced evidence in favour of histamine as the causative factor, and had reproduced in guinea-pigs the phenomena of concealed accidental hæmorrhage by causing acute histamine poisoning. The correct treatment was intimately bound up with the condition of the uterine muscle. Hysterectomy had been advocated because the muscle was supposed to be diseased, but it had now been histologically proved that it was not, and clinically it was well recognised that it had not lost its contractile powers and that repeated pregnancies were possible and safe. Save in exceptional cases there was, therefore, no justification for Cæsarean section in these cases. G. FitzGibbon had treated some cases of concealed accidental hæmorrhage with success by palliative measures, and this appeared to be rational. It was irrational to operate upon a woman in profound shock without any clearly defined reason, as had been done in the past.

Prof. FLETCHER SHAW (Manchester) said that Mr. King had cited the figures of a number of maternity hospitals, showing that albuminuria only occurred in about 30 per cent. of the cases of accidental hæmorrhage, and had quoted Whitridge Williams as giving the figure as 26 per cent. These figures he disagreed with, and thought the mistake arose from the difficulty in making a diagnosis of accidental hæmorrhage. When a patient, far advanced in pregnancy, was brought into a maternity hospital suffering from hæmorrhage the case was diagnosed as one of placenta prævia if the placenta could be felt, and in other cases the diagnosis of accidental hæmorrhage was made. The cases of accidental hæmorrhage thus diagnosed fell into two main clinical groups. In one of them the symptoms were comparatively slight, especially the symptom of shock; this group contained the great bulk of these patients, and he felt sure the large majority of them were really cases of marginal placenta prævia. The treatment of these cases was very simple, as practically all the patients recovered if the membranes were ruptured and ergot or pituitrin was administered, or if—as was done by the Dublin School—the vagina was tightly packed. The other clinical group contained a comparatively small number of cases, but here the patient suffered severely from shock and signs of hæmorrhage. These were the patients in whom treatment was not always satisfactory. These were definitely cases of accidental hæmorrhage, and in his experience every one of them had albuminuria. It was quite possible there might be some other factor along with the toxæmia as a causative agent of the condition, but he felt sure the toxæmia was always present. As another proof that the condition was due to a general cause such as a toxæmia, he mentioned the fact that in all these severe cases there were large hæmatomata formed outside the uterus, and the condition must therefore be looked upon as general, and not as due to a merely local cause affecting the uterus alone. These severe cases of accidental hæmorrhage formed one of the most serious groups met with in obstetrical practice, and no matter what was done there was a large mortality. If the vagina was packed or the membranes ruptured and pituitrin or ergot administered a few of these cases failed to respond, and the patient died of hæmorrhage before the child was born, or, if the uterus was emptied, from post-partum hæmorrhage. The cases referred to were very few, but he felt that when they were met with the best treatment was Cæsarean section followed by hysterectomy. He himself had treated six such cases in a period of three years during the war, and had saved half of them, but it was evident that they were very uncommon from the fact that since that time he had not met a single case in which he felt called upon to do an abdominal section.

Dr. J. E. STACEY (Sheffield) gave figures on antepartum hæmorrhage, from which he concluded that in both accidental hæmorrhage and placenta prævia the cause was toxæmia.—The PRESIDENT said that he thought that the treatment should be palliative in every case.

Mr. A. GOUGH showed a specimen of parasitic myoma removed from a patient aged 42. A pedunculated fibroid the size of a fœtal head had its vascular supply cut off by torsion of its narrow uterine pedicle. At the opposite pole it had adhered to a loop of small intestine, and there was a free supply of blood through the adhesions. The tumour was easily separated and the patient did well.

MIDLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

A MEETING of this Society was held at Derby on Dec. 14th, Mr. FURNEAUX JORDAN (Birmingham), the President, in the chair.

Dr. C. D. LOCHRANE reported two cases of

Dystocia.

CASE 1.—The patient was an 8-para; all her children had been full time and healthy, and she had had no miscarriages. The case was seen in consultation on June 1st, 1925, when Dr. Lochrane found that the head of the fœtus was born, but the trunk could not be delivered on account of a firm irregular mass obstructing the upper half of the pelvis. Previously there had been a slight antepartum hæmorrhage, and although the pains had been strong, the head had only descended to its present position after the mass had been pushed aside.

As moderate traction failed to bring about progress in delivery, the patient was deeply anæsthetised with chloroform and morphia, and after considerable difficulty the mass was pushed up and manipulated above the brim of the pelvis. This allowed the shoulders and the remainder of a well-developed 10 lb. fœtus to be delivered without great difficulty. The fœtus showed no œdema or other external abnormality. Half an hour later a huge, thick, solid placenta was delivered; it was not markedly œdematous, but weighed 3 lb. 3 oz. Microscopically the placental tissue was found to be unduly dense in consistence: no spirochætes were found.

Dr. Lochrane said that he had never heard of another case of dystocia from this cause. The clinical and pathological picture did not support the view that œdema from albuminuria was a predominating factor in the production of this huge organ, neither was there any suggestion of syphilis, although, unfortunately, blood had not been examined by the Wassermann reaction.

CASE 2.—The patient, a primipara aged 23, was admitted to hospital on March 7th, 1926, with a history of having been in labour 40 hours. Her temperature was 98·6° F., her pulse-rate 86, and her general condition good. The uterus was found to be unduly prominent and in state approximating to a tonic contraction; the presentation was by the breech, and the fœtal heart-rate was 114. The os was two fingers-breadth dilated and was displaced upwards. A cystic mass, the size of a Jaffa orange and continuous with the uterus, occupied the pouch of Douglas. The obstruction of labour was regarded as due either to a soft

fibroid of the lower pole of the uterus or to a non-pregnant horn of a bicornuate uterus.

At the Cæsarean section which was immediately performed the lower uterine segment was found stretched over the lower pole of the fœtus, removal of which allowed elevation of the uterus including the intrapelvic portion, which was non-adherent and easily released, being held down by a prominent sacral promontory. The appearance of the uterus at this stage was bicornuate, the left cornu, which contained the placenta, was found to be that portion of the uterus which was incarcerated in the pelvis. After the organ had been manipulated to secure good contraction, the dividing ridge gradually disappeared and all trace of the bicornuate appearance was lost before the abdomen was closed.

In this case, said Dr. Lochrane, it was the rather less distensible part of the uterine wall, comprising the site of placental attachment, which had been incarcerated or sacculated. Without being able to give any figures he was under the impression that a similar observation had been made by others, and this suggested one possible explanation of this form of partial incarceration of the uterus.

Dr. H. A. LAVELLE reported a case of

Rupture of the Bladder followed by Vesico-vaginal Fistula.

The patient, aged 34, was a 2-para 32 weeks pregnant, and was admitted to hospital on Dec. 31st, 1925, following an unsuccessful delivery with forceps. Examination revealed laceration of the vaginal walls with evidence of injury to the bladder, 2 oz. of blood being drawn off by catheter. A large hydrocephalic head partially fixed in the brim was palpated, craniotomy was done, and the fœtus was easily delivered. After operation the patient suffered from incontinence of urine, diarrhœa, and signs of lower abdominal peritonitis accompanied by a pelvic swelling. The temperature remained normal until the seventeenth day after admission. On the twenty-first day the swelling, which then reached to the level of the umbilicus, disappeared, following the discharge of 4–5 pints of foul-smelling pus per vaginam. Except for incontinence of urine the patient made an uninterrupted recovery, but she was readmitted a month ago for the closure of a vesico-vaginal fistula ¾ in. from the cervix.

The abdominal swelling, said Dr. Lavelle, was undoubtedly due to extraperitoneal extravasation of urine, and it was interesting that this should occur in the presence of a vesico-vaginal opening. He thought it probable that the fistula dated from the sudden discharge of pus and that the incontinence previous to this was due to failure of the sphincter.

Dr. LAVELLE also described a case of inversion of uterus.

Dr. ELIZABETH ASHBY reported a case of rupture of the lower uterine segment during Cæsarean section and a case of fits during pregnancy.

A discussion followed in which the PRESIDENT, Mr. C. E. PURSLOW, Mr. MASLEN JONES, Mr. A. M. WEBBER, and Mr. A. B. DANBY took part.

JAMES MACKENZIE INSTITUTE FOR CLINICAL RESEARCH.

Blood Pressure.

ON Dec. 14th Prof. MURRAY LYON reviewed first the factors influencing the blood pressure and showed how the pressure may be altered by the viscosity of the blood, by posture and by mental excitement, muscular effort, and digestion. The effects of these also vary, he pointed out, according to the acceleration or slowing of the heart-beat. Discussing unduly low blood pressure, Prof. Lyon instanced cases of histamine poisoning with peripheral dilatation and loss of blood fluid, which give, he said, a clue to treatment, which should be by transfusion with sugar, saline, or gum solution, the aim being to increase the volume of the blood. It is noteworthy that a high blood pressure may be coexistent with a failing heart. The question whether it is advisable to attempt to reduce a high pressure he answered by saying that probably an attempt to do so should be made in most cases; results will show whether it is wise to go on with the treatment. Prof. Lyon emphasised the importance of physical and mental rest, which should be as complete as possible; in the over-stout and flabby, however, the value of graduated exercise is not to be overlooked. As regards diet, the danger seems to lie not so much in an excess of protein as in overeating generally. A salt-poor or salt-free diet appears useful in some cases. He drew attention to the benefit to be derived from venesection, the removal of 3–20 oz. of blood being followed by a fall of pressure which persists. Discussing the influence of drugs, he suggested that the almost mysterious effects of potassium iodide may be due to a power to reduce the viscosity of the blood. Experimentally, he said, the action of tissue extracts is undoubted, but it has still to be confirmed clinically.

LIVERPOOL MEDICAL INSTITUTION.

A MEETING of this Institution was held on Dec. 16th, when Prof. R. E. KELLY read a paper on the

Surgery of the Common Bile-duct,

based on records of 50 cases in which the common duct was explored. Amongst conclusions drawn from these, he said, were: (1) that the common duct may be packed with stones without jaundice, and even without pain; (2) that stones may be found in the common duct when the gall-bladder is enlarged; (3) that malignant disease may be associated with attacks of pain and a variation in the depth of the jaundice; (4) that stones may be associated with deepening jaundice and no pain; and (5) that malignant disease and stones may be associated. Mere palpation of the common duct was insufficient to give accurate information of the condition of the duct or its contents. Every dilated common duct should be explored with the finger, probe, or catheter, and failure to reach the duodenum by these means should be followed by a transduodenal choledochotomy. Prof. Kelly discussed the difficulty of distinguishing malignant disease from impacted stones in the ampulla of Vater, and said that he thought that malignant disease in this situation was very malignant, and that cures were sometimes due to mistaken diagnosis. As regards the details of operation he had used all the incisions recommended, and for particular reasons liked them all. He thought, however, that in very obese patients who had a wide costal angle the complete transverse incision gave wonderful access and a strong scar. On many occasions he had used the double catheter; one was placed upwards into the hepatic duct and the other down into the duodenum, and the latter served for liquid nourishment.

Dr. WALLACE JONES read a paper on

Vital Capacity in Heart Disease.

In his experiments, he said, he had used a simple water spirometer, the readings being expressed as percentages of the standard normal vital capacity calculated by West's formula. Fifty normal men and 50 normal women were examined to see how closely the actual vital capacity corresponded with the calculated vital capacity. The result showed that though marked individual variation occurred, the average figure was very close to the calculated normal. In organic cardiac disease there was a marked fall in the reading, the average being between 50 per cent. and 60 per cent. of the normal figure. The vital capacity was lowest in the mitral stenosis group, especially when mitral stenosis was associated with auricular fibrillation. In functional cardiac disease the average reading was 85 per cent., a very high figure in view of the marked dyspnœa generally associated with this condition. A group of cases was also kept under observation for a considerable time, and though the vital capacity improved with increase in the cardiac reserve power, the readings only followed slowly the changes in the condition of the heart.

Reviews and Notices of Books.

THÉRAPEUTIQUE CHIRURGICALE.

By P. LECÈNE, Professor of Surgery in the University of Paris; and R. LERICHE, Professor of Surgery in the University of Strasbourg. Vol. I. Pp. 644. Vol. II., with the assistance of F. LEMAITRE. Pp. 507. Paris: Masson et Cie. 1926. 10*s.* each volume.

THESE two volumes, together with the third, which has already been reviewed in these columns, provide a surgical treatise of original type. The point of view of the authors is refreshingly new in a surgical work, in that they emphasise the essentially intellectual nature of a therapeutic decision. To them, assuming a knowledge of pathology, an ability to formulate a correct diagnosis and the memory of past experience, the determination of the best course to pursue is an affair of the mind alone. The book is built upon this supposition. A disease is classified according to its therapeutic indications, the different methods of treatment which have been employed are described in principle, the published evidence in favour of one or the other brought forward and criticised in the light of the authors' wide experience, and recommendations are made. This mental attitude towards surgical problems is not so prevalent as could be wished, though it is perhaps open to argument whether it is possible or even desirable for the operating surgeon to be so detached, since on his mastery of certain details of technique may depend the decision as to the appropriate treatment in a given case. Surgery is a handicraft and an art as well as a science. However, such a scholarly exposition of the principles of surgical therapeutics as is outlined in this book is of value to any surgeon.

Vol. I. on general surgery and that of the extremities is written solely by Leriche, who preserves an even balance in all his opinions. Such questions as the advisability of operating in the presence of shock illustrate this very well. He recommends operating to prevent shock before its onset, but never in its presence, unless it be to stanch a bleeding vessel or to repair a single injury of an extremity. Transfusion of blood in shock he believes to be valueless. The treatment of contaminated wounds is considered in a characteristically logical way. He is against any operation in myositis ossificans, except in rare cases after a very long wait for resorption to occur. In the section on nerve injuries much useful knowledge has been collected. The insistence on the necessity in nerve suture of successive paring of the upper end, until healthy nerve fibrils are met, is sound advice. Contrary to our experience, he believes autogenous nerve-grafts to be successful in 35 per cent. of cases. The treatment of that very troublesome condition, causalgia, is, in succession, periarterial sympathectomy, resection of nerves and resection of the posterior roots. In sarcoma of the bones X rays are said to be useful when the growth is of the round-celled type, useless when it is of the fusiform type, and in any case to have no effect upon the occurrence of metastases. Much pleasure and profit are to be derived from this volume, even when, as in the copy sent for review, it is incorrectly made up, some of the section on the surgery of the upper extremity being missing.

In Vol. II. Lecène writes about diseases of the head and neck, chest and breast, whilst Leriche deals with the spine and pelvis, and Lemaitre with oto-rhino-laryngology. This volume is just as satisfactory as the first. There is abundant evidence of extensive literary research and personal experience. The chapter on the treatment of head injuries makes this difficult subject appear almost simple. The value of lumbar puncture is insisted upon, but the accurate information afforded by a spinal manometer seems to have been overlooked. In regard to tumours of the brain, the writer points out that the removable ones amount to less than one-third of the total, though he does not neglect to mention the work done by Cushing and by Dandy in the removal of gliomata. On the question of exophthalmic goitre he adopts a very sane point of view. He says, in effect, that as yet there are no comparable series of operated and medically treated patients which can give us actual and reliable information as to the value of surgical treatment. He believes it established that one-half the patients recover by medical measures alone, that surgery gives 40 per cent. of cures (possibly more) expeditiously, and that sympathectomy is useless. X rays being without risk, he recommends them for trial. The discussion on cancer of the tongue is also of interest. All methods are reviewed, and the opinion is expressed that treatment in the future may resolve itself into radium for the tongue and surgery for the neck. He believes the improvement in results lies in the hands of the dentists, who see these lesions much earlier than the surgeons do.

This treatise will be read with advantage by any active surgeon. The wide experience of the authors, coupled with extensive study and a logical exposition of the problems to be faced, with definite conclusions wherever knowledge is complete enough to warrant such judgments, render the book of unusual value. There are no illustrations.

PERNICIOUS ANÆMIA.

By F. A. EVANS, M.D. London: Baillière, Tindall and Cox. 1926. Pp. 177. 11*s.* 6*d.*

APART from statistics of the experience of pernicious anæmia at Johns Hopkins Hospital, there is not much in this book which will not be found in the larger systematic text-books. Ætiology, symptoms and treatment are dealt with fairly fully, the anatomy and histology of the blood and organs quite summarily; there is no account of the metabolism of iron. We should have welcomed also some more ample discussion of the nature and pathogenesis of the disease. It is still unknown whether the changes in the red cells are the cause or the result of the excessive hæmolysis. Dr. Evans is impressed by the importance of cholesterin and its variations, facts which are in harmony with the view, suggested by the age-incidence, the inevitable fatality and the histological changes, that the disease is essentially a malignant tumour of red corpuscles. However, the book is evidently meant less for the pathologist than for the clinician, who may find it useful.

TYPES OF MIND AND BODY.

By E. MILLER, M.A. Camb., M.B., M.R.C.S., D.P.M., Neurologist to the Ministry of Pensions, Clinical Psychologist to West End Hospital for Nervous Diseases. London: Kegan Paul, Trench, Trübner and Co. Ltd. 1926. Pp. 132. 2*s.* 6*d.*

Dr. Miller, following Kretschmer, distinguishes two main types of bodily architecture, the "pyknic" (massive and compact) and the "asthenic" (lean and angular). On the psychological plane these types find their correlates, respectively, in the "cyclothymic" and the "schizothymic," the essential difference here being in respect of emotional orientation. This appears to resemble closely the extro-introvert classification of Jung, and the distinction is an important one for psychopathology, though of limited usefulness as a type formula when applied to more or less normal individuals. Space is found in this small book for a useful account of the results of recent research on the endocrine glands and their neural connexions. The author holds that this "endocrinic-vegetative" system provides a medium for the interaction of psychical processes and bodily structure, and suggests that constitutional idiosyncrasy of this part of the organism may be the foundation-stone of type.

No reader could expect to find a complete guide to the diversity of human personality in a small volume such as this, but Dr. Miller's book will repay perusal

by suggesting a perspective and stimulating ideas. It is attractively written and is embellished with five portraits illustrative of the argument.

HYSTERIA.

By ERNST KRETSCHMER, M.D., Professor of Neurology and Psychiatry in Tübingen. Authorised English translation by OSWALD H. BOLTZ, M.D., Senior Assistant Physician in the Manhattan State Hospital, New York City. New York and Washington: Nervous and Mental Disease Publishing Company. 1926. Pp. 120.

THE approach to the problems of hysteria has within recent years been oriented almost entirely from the viewpoint that its phenomena represent a type of psychogenic reaction. According to many this reaction is based on the existence of a prepared subsoil, latent in all, so that all are potential hysterics; others regard the hysterical syndrome as the expression of a certain purpose (half hidden or altogether concealed), a kind of "flight into sickness," of "gain through sickness." The aim of the author is to amalgamate these two seemingly divergent conceptions by endeavouring to show that the hysterical type of psychogenic reaction consists in the development of a tendency to dissimulation and in the use made by the latter of reflex, instinctive, or otherwise biologically preformed mechanisms. This view is developed with ingenuity and plausibility, and is satisfying in the sense that it endeavours in some degree to account for the physiological peculiarities of the psychoneurosis, a feature of the condition which seems to impress neurologists more than psychologists. No explanation can make any pretence to finality unless it takes these peculiarities into consideration. Dr. Kretschmer's monograph deserves to be studied by all who are interested in the problems of hysteria.

LYMPHOCYTES.

The Lymphocyte in Resistance to Tissue-Grafting Malignant Disease and Tuberculous Infection. An Experimental Study. By JAMES B. MURPHY, M.D. New York: Monographs of the Rockefeller Institute for Medical Research. No. 21. 1926. Pp. 168. $2.

DURING the past 14 years Dr. Murphy and his collaborators have published a large number of papers—over 60, as he states in the introduction to this monograph—in which he has tried to establish by a great variety of experiments that the resistance of the organism to the growth of a malignant tumour resides in the lymphocytes. According to him a diminution in the lymphocytes diminishes the resistance, while an increase raises the resistance, and this applies not only to the growth of transplanted tumours, but also to that of spontaneous tumours.

The practical and theoretical importance of this contention is obvious. Accordingly the earlier experiments of Dr. Murphy, on which his conception was based, have been repeated by several observers (Stevenson, Sittenfield, Prime),[1] who completely failed to confirm his experimental observations. In subsequent papers Dr. Murphy has taken the unusual course of ignoring these criticisms and of putting forward new, though less conclusive, evidence in support of his contention. In one of these experiments, which attracted some attention, he claimed to have shown that in a mouse an area of skin, if exposed to an erythema dose of X rays, became resistant to the inoculation of a transplantable tumour if the tumour was implanted *intracutaneously*, while *subcutaneous* transplantation under the same area resulted in the growth of a tumour. Although the placing of a piece of tumour into the intracutaneous connective tissue of so delicate a structure as the skin of a mouse so as to avoid the subcutaneous connective tissue is a matter of great technical difficulty, no details were given to show how this could be accomplished. A few low-power microphotographs would have furnished evidence in support of the author's contentions that he had succeeded in restricting the implant to the cutis, but the only figure published gives no indication of the site of the inoculation. In view of these doubts, Dr. Murphy's work has not met with general acceptance and has not found the clinical application of which it is obviously capable.

The present monograph is not a collection of reprints. The author has taken his published observations and "brought them together in a logical fashion in the form of a general summary for the convenience of the reader." This has involved a rewriting of the whole matter. The restatement of experimental results, the correctness of which has been questioned, without a reference to the published work of critics, is misleading to those readers who are not fully acquainted with the literature, while to those who are, it must deepen the doubts which they have entertained. On the problem itself, whether the lymphocyte represents a mechanism of defence against the growth of cancer, the verdict must be, under the circumstances, "not proven."

[1] Journal of Cancer Research, 1917, ii.; 1920, v.

HEART AFFECTIONS.

Principles of Diagnosis and Treatment in Heart Affections. Third edition. By Sir JAMES MACKENZIE, M.D., F.R.S., &c., St. Andrew's Institute for Clinical Research; and JAMES ORR, M.B., Ch.B., Physician to the Institute. London: Humphrey Milford. 1926. Pp. 242. 10*s.* 6*d.*

THE third edition of the "Principles" is edited by Dr. James Orr, who collaborated with Sir James Mackenzie in the previous edition. Many sections have been rewritten, and much new matter added, in order to incorporate the more recent theories developed by the late author and his associates at the St. Andrew's Institute for Clinical Research. Whether the work has gained or lost in value by these changes must remain a matter of opinion. To simplify knowledge, by searching for fundamental principles, is admittedly the object of science, but such principles can only be evolved very gradually, and there is always a danger in attempting to apply them prematurely. This danger is illustrated by the chapter on auricular flutter, where the generally accepted explanation of this condition—namely, circus movement—appears to be rejected by the author, not because the experimental evidence is unsound, but because such a hypothesis fails to conform with the "law" that activity of an organ depends on certain regulating structures. Surely the "law" should be made to fit the facts, and not the facts the "law."

In previous editions of this book the subject-matter consisted primarily of a simple record of careful clinical observations; it is probable that the reader who, owing to limitations of time, is compelled to confine his attention to a small book on a large subject is in search of facts rather than theories. But disciples of the late Sir James Mackenzie doubtless feel it to be a pious duty to act as guides to the path which their master was exploring at the time of his death, and practitioners who have derived practical help from previous editions may now be willing to take an excursion into more obscure realms.

PEDIATRICS.

Clinical Pediatrics. Edited by R. S. HAYNES, M.D., Clinical Professor of Diseases of Children, Columbia University, New York. Vols. I.–V. London and New York: D. Appleton and Co. 1926. 16*s.* per volume.

THE first five volumes of Prof. Haynes's system of pediatrics give promise that the completed work will occupy a prominent position in medical literature. The aim of the editor is to provide the practitioner with a series of readable monographs on the various phases of children's disease, presented, as far as possible, from the clinical standpoint, and with direct relation to treatment. This aim has been most successfully carried out in the volumes which have so far appeared. Vol. I., by Dr. R. W. Lobenstine and

Dr. H. C. Bailey, is entitled Prenatal Care, but also includes many problems of abnormal labour and a discussion of breast-feeding. Perhaps its most useful feature is the detailed account which it gives of the ideal régime during pregnancy. The medical complications of pregnancy, particularly cardiac disease, are well described, and an excellent chapter on syphilis is included. The illustrations, though not original, are well chosen. This volume by itself should have a large field of utility, as well as forming an attractive unit of the series. Vols. II. and III., by Prof. Clifford Grulee and Dr. Barnet Bonar, are devoted to the new-born. In Vol. II. the physiology of the infant is discussed in considerable detail, and anthropometric statistics and the principal factors in growth and development are presented in an unusually readable form. An extremely interesting chapter on the circulatory system sets out the characteristics of the infant's blood and also those of heart muscle as shown by electrocardiogram. Asphyxia, icterus, and hæmorrhagic disorders are considered in relation to physiology and treatment. Vol. III. is written from the clinical standpoint, and contains an admirable description of the diseases and malformations met with in the new-born. A large amount of recent work has been included, and is rendered accessible to the reader by a comprehensive bibliography. The authors' presentation of the much-disputed questions of cerebral lesions is one of the best in the literature; the different possibilities in the ætiology are set out extremely fairly, while in general they accept the conclusions of O. H. Schwartz, and regard the majority of cerebral lesions as traumatic. The account of the diagnosis and treatment of these lesions is eminently practical; the difficulties of diagnosis, and the disappointing results of lumbar puncture, diagnostic or therapeutic, are clearly indicated, and a strictly conservative line of treatment is advocated. In Vol. IV., on Preventive Pediatrics, Prof. Borden Veeder deals with problems of heredity, diet, and management in infancy and childhood in a lucid and convincing manner. His methods of infant feeding have the great advantage of being simple and practicable. He has little sympathy with complicated formula-feeding, which he considers to have diverted attention from the importance of breast-feeding, as well as being unnecessary and pseudo-scientific. Clear instructions are laid down for the composition of simple modifications of milk, and are followed by full diet tables for older children. Vol. V., by Dr. Bronson Crothers, on Disorders of the Nervous System in Childhood, is the least comprehensive, though by no means the least interesting of the series. The author has expressly declined to give an exhaustive account of nervous syndromes, and has limited himself in general to the consideration of two points: whether the disease is inevitably progressive or can be arrested, and whether the residual condition can be improved by re-education. As a manual of treatment we have nothing but praise for this volume. It has the advantage of being written in a spirit of optimism, and of regarding nervous disorder from a dynamic point of view, entirely free from all distinctions of "functional and organic." On the side of diagnosis the book is necessarily incomplete, and in this respect the reader will perhaps experience some of the disappointment which the author foreshadows in his prefatory remarks.

These volumes are attractive in appearance, of convenient size, and well illustrated. By way of comment and not of criticism, it may be noted that the distribution of space is not very even; while all the volumes fulfil the object for which they were written, some of them go decidedly beyond it. The two volumes on the new-born constitute a most exhaustive account of the subject, comprehensive enough for any book of reference; on the other hand, in Vol. V., on Diseases of the Nervous System, the author has confined himself largely to matter bearing directly on effective treatment. A certain amount of overlapping is inevitable in a series of this kind; cerebral birth-trauma, for instance, is dealt with by different authors in Vols. I., III. and V., and breast-feeding in Vols. I. and II. The publication of further units in the series will be awaited with interest by readers on both sides of the Atlantic.

Diseases of Infancy and Childhood. Ninth edition. By L. EMMETT HOLT, M.D., and JOHN HOWLAND, M.D. D. Appleton and Co. 1926. Pp. 1018. 35*s.*

THE appearance of the ninth edition of this well-known text-book brings with it a reminder of the great losses which American pediatrics has suffered in the last few years. Prof. Holt, the original author, died in 1924, two years after the publication of the eighth edition. Prof. Howland, who had undertaken the greater part of the revision of the recent editions, died last June. In a preface by Dr. E. A. Park we read that he lived to complete the writing of this volume, though not to see its publication. The ninth edition retains very completely the form of its predecessors; there are numerous small additions throughout the text, but on the whole there are few important alterations. The account of the treatment of diarrhœa in infants has undergone some modification; the use of protein milk is adopted as the method of choice. A fuller description is given of the pathology of nephritis, particularly the acute forms. Recent work on tetany and some other nervous disorders has been included. A new section has been written on erythrœdema; the author maintains a sceptical attitude towards much of the pathological work which has been published on this subject, and does not accept any nervous lesion as essential. The older parts of this book are too well known to require comment. The new edition has brought them thoroughly up to date, and will fully maintain the reputation of the work, and perpetuate the memory of two of the most eminent members of the American school of pediatrics.

ROUND THE WORLD WITH A DICTAPHONE.

A Record of Men and Movements in 1926. By Sir HENRY LUNN, M.A., M.D., B.Ch. London: Ernest Benn, Ltd. 1927. Pp. 301. 10*s.* 6*d.*

Sir Henry Lunn's journey was made for the purpose of promoting friendship among the English-speaking peoples and of bringing the Churches into closer union. But on this journey he took with him the eyes and the outlook of a man with a sound medical qualification who began life as a missionary, and the book is full of keen observations and amusing stories, many of them told against the author, as when he reached an American town which was placarded in large capitals with "British Peer gives millions for Peace," and when, in commenting on the immense importation of motor-cars into New Zealand, he said he supposed the Maoris did not drive in cars, only to learn that the Maori will sell everything he has to possess a motor-car. In various parts of the world he came across old medical acquaintances, as, for example, Prof. F. Wood-Jones in connexion with ethnological and blood-group studies at Hawaii, and the tragedy of Tasmania, where the last native died 40 years ago without any record having been taken of the folklore or of the habits of an interesting people. In New Zealand also he rediscovered an old friend, who proved to be the only commissioned officer in the R.A.M.C. who ever rose from the ranks. He notes the absence of racial prejudice in New Zealand and the award to a Chinese boy of a Navy League prize; the fact that protective duties result in Australian butter being sold in London at 4*d.* a pound less than its price in the Commonwealth; and the tremendous vogue which the totalisator is having in the same country. The volume is well illustrated, and gives a clear picture of impressions gained in many countries by one who disarms the critical reader by his generous enthusiasms. The title of the book bears witness to the fact that the chapters were dictated to an instrument while the scenes were still fresh in the author's mind.

THE LANCET.

LONDON: SATURDAY, JANUARY 8, 1927.

NEUROLOGICAL SURGERY.

THE formation and inauguration of a Society of British Neurological Surgeons is a sign of the times. Relatively limited in numbers as the exponents of this particular branch of surgery must be, if only because in comparison with other surgical conditions their clinical material is somewhat restricted, they constitute nevertheless a professional coterie of some significance and importance, and are animated, we may feel sure, with a spirit of scientific hopefulness. Sir CHARLES BALLANCE has been elected the first President of the Society, which has honoured itself by securing as honorary members Sir DAVID FERRIER, Sir EDWARD SHARPEY-SCHAFER, Sir CHARLES SHERRINGTON, Sir ARTHUR KEITH, and Prof. G. ELLIOT SMITH. America has already forestalled this interesting development by the founding of a Society of Neuro-Surgeons (it is matter for minor congratulation that our British colleagues have avoided the adoption of this needlessly contracted neologism for their own description), and, as is known, there have been in various countries and at various times prominent exponents of the surgery of the nervous system; pioneers, indeed, in what has now come to take a recognised place among the specialties. These, however, as is also known, were not infrequently compelled by circumstances to "play a lone hand," but their names and memories, which in some instances that come readily to the mind are all that remain, are still potent to inspire their successors, now usefully associated in a company of experts whose future transactions will be followed with interest and instruction by not a few in the more general ranks of surgery.

So recent, comparatively speaking, has been the organisation of attack on conditions of the nervous system amenable to surgical intervention, that the lifetime of some still fortunately with us covers practically the whole period within which such efforts have come to be regarded as definitely comprisable in the scope of surgical procedure. It is true, no doubt, that the more obvious pathological states of depressed cranial fracture, rupture of meningeal vessels, and so forth, were handled by "surgeons" as early as medical history begins. and that for less certainly diagnosed conditions resort was made to trepanning by members of races both with and without any pretence to civilisation, in times long past, as well as in the darker corners of the earth to-day; but there can equally be no doubt that the era of promise in respect of scientific neurological surgery was entered on only when the experimentalist showed the way by his investigations into the neurophysiology of the lower animals, and when the researches of the neuro-anatomist finally elucidated the intimate structure of the neuraxis and its appendages. Thus it is natural and just that the honorary members of the new Society should consist of very distinguished anatomists and physiologists, not only because of the cardinal rôle they have played in rendering possible the appearance of the Society in the fullness of time, but also because their nominal association with it will prove a constant reminder to its active members of the fundamental basis of all successful surgery—viz., knowledge of the anatomy and physiology of the mechanisms with which they deal. Some may suppose the day will pass when the neurological surgeon will be content to have his clinical diagnoses made for him by neurological physicians; with one or two notable exceptions, such has been the relationship more or less tacitly acquiesced in by those who have regarded themselves as competent to operate in nervous cases. Yet under a considerable variety of circumstances collaboration of physician and surgeon still remains desirable if not always essential, and in respect of the nervous system accuracy in topographical diagnosis is an indispensable preliminary to surgical success. Hence the surgeon either ought himself to have had a training in neurology or should be prepared to utilise the aid which the neurologist can give him. Be this as it may, it is unquestionably for the ultimate benefit of mankind that surgery should persistently insinuate itself into a region which has been explored in little more than its confines. The spectre of "inaccessibility" has often handicapped well-intentioned if less well-directed efforts, but with slow and steady steps the range of feasible interference is being extended. Of no less importance is operative security for the patient, and if for some cerebral operations mortality percentages are still high, surgery is but experiencing in this field the hard schooling it has had in others ere increase of knowledge has widened the margins of safety. A further equally important aspect of neurological surgery concerns the attainment of adequate degrees of functional recovery after operation. Herein, we believe, would lie one of the major advantages to be expected at the surgeon's hands, if only the possibility could be relied on with some little confidence; but too often have technical surgical successes been unaccompanied by functional restitution, largely owing to the peculiar compactness of the structures forming the nervous system, whose physiological value is out of all proportion to their mass. Delicacy of touch and nicety of manipulation are here as requisite and will repay the surgeon's skill as greatly as in the case of the eye or the ear. To conserve function is an aim no less worthy of his concentrated effort than to remove the results of disease.

A wide field lies open before this new Society for theoretical and practical study. We felicitate its members on their realisation of the advantages of corporate existence, and believe its installation will usher in a period of enhanced knowledge of the functions of the nervous system and of ever more successful treatment of the serious diseased states with which it is the province of the surgeon to deal.

THE ALLEGED INCREASE OF CANCER.

IN all European countries except one the recorded mortality from cancer has shown a rapid increase during the last 40 years. The one exception is Switzerland, which by 1880 had the highest death-rate from cancer of all European countries, and has maintained this high rate during the present century without showing any marked increase. In the meantime the increase in some of the other European countries has been so great that England and Wales, for instance, which in 1881 had only half the crude death-rate from cancer of Switzerland, now equals it. The same holds good for Sweden and Holland, while the death-rate for the urban population in Denmark, which by the end of last century equalled that of Switzerland, now exceeds it. It is generally

agreed—except by uncritical or uninformed writers—that a large proportion of this increase is apparent and not real. This is due to a variety of factors inherent in the pathology of cancer. Cancer is a disease of middle age and of old age, and since more persons now reach the cancer age owing to more successful treatment of other diseases and the absence of epidemics, this in itself is bound to increase the "crude mortality-rate" from cancer. This fallacy can be corrected by appropriate calculations. Another disturbing factor is the difficulty of diagnosing cancer, owing to the absence of specific symptoms. A large number of cases of cancer are therefore not diagnosed as such during life, and in the absence of a post-mortem examination are recorded under another cause of death than cancer. The number of such cases gradually diminishes as our knowledge of the disease increases and as new methods of clinical examination, such as the cystoscope, the sigmoidoscope, and X rays are being introduced and becoming more universal in their application. But an examination of hospital post-mortem records has shown that even under the most favourable conditions the number of cases of cancer which die without the disease being recognised amounts to no less than about 25 per cent. Another factor which has not received sufficient consideration is the greater frequency with which cancer is now being diagnosed in its earlier stages and the resultant greater frequency of operative treatment. When the disease is diagnosed in its earlier stages the patient and the patient's relatives are necessarily acquainted with the nature of the disease in order to justify the necessity for an operation. After the operation the diagnosis is confirmed by microscopic examination. The diagnosis of malignancy is thus "fixed" for this particular case, and if the patient dies within five years after the operation the case will be returned as cancer whether a post-mortem examination is made or not. But if the diagnosis is made late, when the case is inoperable, the nature of the disease may be kept from the patient and even from the patient's relatives, and as the diagnosis has not the same certainty the medical man in attendance may prefer to return the case as other than cancer. It is surely more than a coincidence that there is one country in which the medical man in attendance gives two certificates of death, one to the family as a prerequisite to burial and another one as a confidential report of the cause of death to the Statistical Bureau, and that in this country—Switzerland—the recorded mortality from cancer has always been high and has shown no increase for the last 25 years.

It was a great advance in our understanding of the significance of cancer statistics when G. KING and A. NEWSHOLME in 1893 pointed out that errors in diagnosis must necessarily affect more the death rate from cancer of inaccessible sites, such as stomach and intestine, than of accessible sites, such as the breast and female genital organs. They analysed accordingly the death-rate from cancer of these two groups in a restricted community with a highly efficient medical service—the city of Frankfurt—where records for the death-rate from cancer of different sites were available. They found that the increases in the cancer mortality during the period of 1860–87 fell entirely on the inaccessible sites, and a continuation of their studies by W. E. WILLCOX showed exactly the same relationship for the succeeding period up to 1913. The mortality returns for cancer of the accessible sites showed therefore during the whole of the period the same degree of reliability, and the fact that the increase in the total cancer death-rate fell entirely on the inaccessible sites was accepted as evidence that this increase was an apparent one due to improved diagnosis, and not a real one. That is a reasonable argument. But it is an obvious logical fallacy to invert this sequence by arguing that an increase in the death-rate from cancer of the accessible sites necessarily represents a real increase. Such an increase might also quite well be due to such factors as more accurate diagnosis or more frequent operative treatment. This is the fallacy underlying the argument in a recent official publication issued by the United States Public Health Service and entitled "The Course of Cancer Mortality in the Ten Original Registration States for the Twenty-one-year Period, 1900–1920."[1] This Bulletin contains in an appendix 114 tables giving the death-rates from cancer in the ten registration States arranged for the different age-groups and according to the different sites. In the text, which has been written by Dr. G. W. SCHERESCHEWSKI, this statistical material is very clearly analysed and corrections are made for those various errors which can be evaluated statistically. After having made all those deductions the figures show a considerable increase in the total death-rate from cancer during the period 1900–20, and this increase is due not only to cancer of inaccessible sites, but also to an increase in cancer of the accessible sites. At this point Dr. SCHERESCHEWSKI makes a bold assumption. He holds that the accuracy of diagnosis has remained the same for the whole of the period. On this point he writes (p. 51): "While there is still much room for improvement in diagnostic skill leading to early diagnosis of the disease, when cancer of even inaccessible sites has progressed to a stage where death is imminent, in a great majority of instances the symptoms at that time are so characteristic and pronounced that no difficulty should be experienced, even by the medical tyro, in determining the cause of death. From the standpoint of professional skill permitting the recognition of cancer in the agonal stages, it does not seem probable that the physicians of 1900 were much, if at all, inferior to their brethren of to-day." On a previous page (p. 47) he speaks of "cancers of accessible sites as the buccal cavity, breast, female genital organs, and the skin in which errors, *so far as death certification is concerned* (the italics are ours), hardly ever occur."

Starting from these premises Dr. SCHERESCHEWSKI is enabled to conclude from the statistics that the increase in the death-rate from cancer of the accessible sites is real and not apparent, and that the contrary view is no longer tenable. But the assumption of the accuracy of death certification and of diagnosis which he makes is not supported by any evidence, statistical or otherwise. It is merely an assertion, and if anyone chooses to disagree with it the whole conclusion falls to the ground. It would, in fact, be easy to make out a good case against Dr. SCHERESCHEWSKI'S assertion. The statistics refer to a vast district, as extensive as the whole of Western Europe, in which an enormously rapid development has taken place during the period of observation. The population has increased from 20 millions to 27 millions, means of communication have greatly improved, there has been an enormous advance in medical education all over the United States and especially in the ten registration States, so that to-day many look to the States as a model of progressive medicine. This change must necessarily

[1] Public Health Bulletin, No. 155, Washington Government Printing Office, 1925.

have affected the facilities for hospital treatment. Lastly, during the last 12 years or so the American Society for the Control of Cancer has carried out an intensive campaign with the object of educating the public to seek medical advice at the earliest possible stage of cancer. The society claims that this campaign has been successful and that a much greater number of patients now present themselves with the disease in an operable stage. All these conditions are very different from those obtaining in the limited community of the city of Frankfurt, which formed the material of the investigations of KING and NEWSHOLME and of WILLCOX. We are not prepared to assert that these various factors are responsible for the whole of the increase in the death-rate from cancer of the breast and of the female genital organs recorded in the American statistics. It is sufficient to realise that this may be the case and that there is no method of evaluating these factors. Since the choice between the two alternative explanations is therefore quite arbitrary, the American statistics do not enable us to decide whether the recorded increase is apparent or real. An investigation on the cancer death-rate in a limited community with a highly efficient medical service and a stable population is more likely to yield instructive results. Such an investigation was actually carried out some years ago by Dr. W. T. HOWARD[2] for the city of Baltimore. Dr. HOWARD found no increase in the mortality from cancer of the breast and cancer of the female genital organs, but actually a reduction. Dr. SCHERESCHEWSKI, who quotes Dr. HOWARD'S investigation, states, however, that in a personal communication Dr. HOWARD informed him that the calculations upon which these conclusions were based are erroneous. Dr. SCHERESCHEWSKI states further that, on the contrary, the figures furnished by the Bureau of the Census show a distinct increase. But the actual figures are not given by Dr. SCHERESCHEWSKI, and it is not even stated whether the increase refers to the crude mortality-rate or to the corrected rate. It seems highly desirable that the corrected figures for Dr. HOWARD'S calculations should be published, for they would furnish a good test for the validity of Dr. SCHERESCHEWSKI'S assumption, on which his conclusions rest. If it be true that throughout the whole ten registration States the diagnosis and death certification for cancer of the accessible sites has remained uniformly accurate during the period 1900–20, then the increase in the mortality from cancer of the breast and female genital organs in Baltimore should be of the same high order as that recorded for the ten registration States. If the figures are found to be distinctly lower for Baltimore, Dr. SCHERESCHEWSKI'S assumption would be shown to be unfounded and the problem would require further analysis.

Our point is not to deny a real increase in the death-rate from cancer, but rather to plead for a recognition of the strength of the arguments against this view. If the statistics of large communities give prima facie evidence of a real increase in cancer, as is the case not only for the United States but also for England and Wales, as shown in the Registrar-General's Report for 1917, why is this increase not revealed by statistics of small communities such as Frankfurt, Baltimore, and Switzerland, in which the conditions for accurate registration are highly efficient and which should give, therefore, the most accurate reflection of this increase? Until this discrepancy is accounted for satisfactorily the contention that the increase in cancer is real remains unproven.

[2] Jour. Amer. Med. Assoc., 1923, lxxx.

FAT AND TUBERCLE.

LONG ago HUGHES BENNETT suggested that the main causes of tuberculosis were the dearness of butter and the abundance of pastry-cooks; the poor, he said, do not get sufficient fat, and the upper classes disorder their digestion by puff-paste. The part played by fats in the household of the body, although not as yet fully determined, is unquestionably very large and the shortage of fat during and after the war brought this home to many who had previously been sceptical on the point. Shortly before the armistice Prof. E. H. STARLING was requested by the Scientific Food Commission to set out the evidence, as it then existed, for the indispensability of fat. He was unable to find good evidence for a strict lower limit of necessity provided that the caloric value of the diet as a whole was sufficient to meet the needs of the body, but he pointed out that the breast-fed infant's diet owes 50 per cent. of its total energy value to fat, and that up to the age of 6 years a percentage of 35, and thereafter of 20–25, should be regarded as the minimum desirable. These proportions can be augmented without interfering with efficiency or with health, and, Prof. STARLING thought, diminished without serious detriment to health, though probably not without inconvenience and diminution of efficiency. He had not before him then the evidence which we now have of the great increase of tuberculosis in countries where the fat ration was most restricted. And at that time not much attention had been paid to the distribution of the accessory factors in animal and vegetable fat, although Prof. J. C. DRUMMOND had expressed a desire to enforce the addition to margarine of a proportion of cow butter, egg yolk, or oleo-oil to provide an adequate source of the fat-soluble factor. Evidence which has since accumulated in Central Europe points to the importance of this element of the diet in raising the resistance to infection from tuberculosis. More than that, part of the accepted treatment of a case of pulmonary tuberculosis is "feeding up," in which process fat undoubtedly plays an important part, and where there is risk of infection the common-sense prophylactic measures include a satisfactory diet, rich in fat. As a contribution to this subject, a small but intensive study by Dr. W. B. VAILE, appearing on p. 72 of our present issue, will certainly be read with interest. Dr. VAILE investigated in all 24 families consisting of 162 persons; he went carefully into all the possible factors and was struck with the varying tendencies exhibited by different members of the families towards fat. It was possible, he found, to separate two distinct groups of "fat-eaters" and "fat-shy" individuals, and when these groups were investigated with regard to pulmonary tuberculosis the results were remarkable. Of the 101 fat-eaters, 96 were alive and well, 4 certainly had pulmonary tuberculosis, and 1 doubtfully so. There were 61 "fat-shy" persons, of whom only 11 were alive and well, 48 certainly had tuberculosis, all pulmonary except 2, in which the localisation was hip and ankle respectively, and the remaining 2 had doubtful tuberculosis. To complete the story, there were also 2 persons alive and well about whose food habits no information could be obtained.

The examples given in Dr. VAILE'S paper illustrate these results, although they give little indication of their correct explanation. The statistical investigation of pulmonary tuberculosis is notoriously fraught with difficulties. Even the well-known and much-quoted results obtained by KARL PEARSON as to the inheritance of a tuberculous diathesis have been criticised in the light of evidence

obtained, particularly in France, by the removal of children from a source of infection early in life, who then grow up with actually less "tendency" to tuberculosis than the population at large. The explanation of this, and possibly other difficulties, lies in an appreciation of the fact, insisted upon again largely by the modern French school, that it is infection in the very earliest months of life which counts, and that pulmonary tuberculosis in later life represents a reactivation of an old process or a superimposed reinfection. If this is so, it may be that the relationship between fat in the diet and pulmonary tuberculosis is to be explained by supposing that the absence of desire for fat is one of the general symptoms of latent tuberculous infection. The child with the "habitus phthisicus," who is probably already infected, may dislike fat just as the child who suffers from cyclical vomiting often shows a marked liking for fat, or as the pregnant woman affects curious articles of diet, the like or dislike being possibly associated with biochemical conditions. On the other hand, it may really be, as Dr. VAILE suggests, that the people who eat fat escape the development of infection because their resistance is higher than that of the "fat-shy" group. How resistance is raised by the intake of fat is, again, a matter for speculation. The good results of cod-liver oil in pulmonary tuberculosis may throw some light on this, for the antirachitic vitamin is apparently concerned with the process of calcification, and the ultimate cure of pulmonary tuberculosis is generally associated with the laying down of lime salts in the healing lesion. Incidentally, it would be interesting to learn if the dislike for cod-liver oil, present in certain people, is more frequent in those with tuberculosis, as would seem likely from Dr. VAILE'S results. He submits some evidence that fat taken under compulsion is as effective in preventing tuberculosis as fat taken with avidity, although many physicians agree with LAUDER BRUNTON that the instinct of some children who refuse to eat fat is perfectly right. Fat is undoubtedly a costly item in the daily dietary, but it will be an added reason for encouraging its use if Dr. VAILE'S results can be confirmed on a large scale.

TUBERCULOSIS SOCIETY.—A meeting of this society will be held on Friday, Jan. 14th, at 1, Wimpole-street, London, W., at 8 P.M., when Dr. C. D. Agassiz will read a paper on the Differential Diagnosis of Non-Tuberculous Fibrosis of the Lungs. A discussion will follow.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Jan. 27th the lectures on Emergencies in Medicine and Surgery will be continued at 5 P.M., at the rooms of the Medical Society of London, Dr. L. S. Burrell will lecture on Hæmoptysis, the lecture being free to members of the medical profession. The clinical demonstrations in surgery and ophthalmology will also be resumed during the month. Courses in January, which have already been announced, are: Jan. 10th to 22nd, Medicine, Surgery, and the Specialties, at the Prince of Wales's General Hospital; Jan. 10th to 22nd, Diseases of Children, at the Children's Clinic and the Royal Free Hospital; Jan. 11th to Feb. 5th, by-weekly lecture-demonstrations, at the Bethlem Royal Hospital; and Jan. 17th to 29th, Cardiology, at the National Hospital for Diseases of the Heart. From Jan. 31st to Feb. 26th the London Lock Hospital will hold a comprehensive course in Venereal Diseases. A special course in dermatology will be given at St. John's Hospital from Jan. 31st for four weeks. Classes in pathology can also be arranged. From Feb. 7th to 19th there will be an all-day course in Diseases of Children held at the Paddington Green and the Victoria Hospitals. For one week, starting on Feb. 21st, a general practitioners' course will be given at the Royal Northern Hospital; no fee will be charged. Syllabuses of the special courses and copies of the general course programme and of the *Post-Graduate Medical Journal* may be had from the Secretary of the Fellowship, at 1, Wimpole-street, London, W. 1.

Annotations.

"Ne quid nimis."

NEW YEAR HONOURS.

THE list of Honours published on Jan. 1st, which was a small one, recognises the work of medical men in various parts of the Empire. Neurologists everywhere will rejoice at the knighthood conferred on Dr. Henry Head, F.R.S., whose work has cleared up dark places in the structure and function of the nervous system for his own and future generations. Dr. Thomas Houston, who also receives a knighthood, has filled many positions in Queen's University, Belfast, and made his influence felt in public affairs. Colonel Corrie Hudson, C.I.E., D.S.O., who has been awarded the C.B., Military Division, is Assistant Director of Medical Services at Aden, and Lieut.-Colonel John Wolfran Cornwall, I.M.S. retd., who has been made C.I.E., directed until recently the Southern India Pasteur Institute. In offering hearty congratulation on behalf of the medical profession to colleagues who have received well-deserved honours, we extend our good wishes to the Rev. Edwin William Edward Lant, superintendent of the Leper Home and Hospital at Dichpalli, Hyderabad, and to Miss Rose Harvey, superintendent of the Nasik Leper Asylum, Bombay, who have received the Kaisar-i-Hind medal of the first class, as well as to two other women whose appointment as C.B.E. follows on distinguished work in preventive medicine—Mrs. Grace Thyrza Kimmins, founder of the Heritage Craft School for Crippled Children, and Miss Katherine Janie Stephenson, vice-chairman of the Wilts Public Health Committee.

INSULIN IN SURGERY.

THE diabetic patient has always been a severe trial to the surgeon. High sugar-content in the blood renders a person very susceptible to local infection, and diabetics require surgical treatment of boils, dental abscesses, pyelitis, appendicitis, and pelvic and other suppurations more often than do non-diabetics. But, in the words of Sir Frederick Treves, "Diabetes offers a serious bar to any kind of operation. A wound in a diabetic patient will probably not heal, while the tissues appear to offer the most favourable soil for the development of putrefactive and pyogenic bacteria." The preparation of insulin has, therefore, been as great a blessing to the surgeon as it has to the physician, and Prof. J. A. Nixon has recently described its surgical employment in a paper read before the Bath and Bristol Branch of the British Medical Association.[1] Dr. Nixon does not agree that once a patient starts taking insulin he must continue throughout life. Many patients of local infections are undiscovered diabetics or potential diabetics. Their carbohydrate tolerance is low but sufficient to deal with an adequate diet. When they contract an infection their tolerance is lowered, with the result that they can no longer metabolise sufficient carbohydrate, and their resistance to infection is dangerously decreased. The surgeon should not hesitate to use insulin here. When the patient has successfully overcome the infection, his carbohydrate tolerance may rise again and the insulin can be discontinued. To impose a strict dietary is highly dangerous, for the diabetic with an infection needs more carbohydrate, not less. The only way to enable him to utilise it is to give insulin in proportion to his carbohydrate demand. In true diabetic gangrene insulin treatment should never be delayed; even if it does not cure the gangrene, it will add considerably to the chances of success in operation, which without it will probably fail. A deliberate operation, for whatever cause and of whatever magnitude, should always, in Dr. Nixon's opinion, be preceded by a course of insulin lasting two or three

[1] Bristol Medico-Chirurgical Journal, Winter 1926, p. 199.

weeks. This restores the blood-sugar to normal, gives the patient an adequate carbohydrate diet, and repairs his nutrition as far as possible. Dr. Nixon is vehement in his condemnation of under-nutrition in the treatment of diabetes, and quotes Mosenthal's dictum that, whereas insulin diminishes the blood-sugar and sets aside glycosuria by allowing the body to utilise more glucose, starvation allows the accumulated glucose to escape in the urine. Starvation is floating a stranded ship by jettisoning her cargo, while insulin treatment takes her off on a rising tide. Insulin allows of the storage of glycogen that is so important after operation; under-nutrition depletes the store. Apart from these risks there is a peculiar danger for diabetics in anæsthesia. All anæsthetics produce a rise in blood-sugar, chloroform being the worst; local infiltration may cause extensive necrosis and spinal anæsthesia may produce coma. Pre-operative starvation by itself may result in post-operative acetonæmia and acidosis, even in a non-diabetic, and for the diabetic no form of anæsthesia is safe until he has assimilated an adequate amount of carbohydrate. It is sugar that protects him from infection, shock, and coma, and insulin raises the blockade and allows the blood-sugar to come to the relief of the beleaguered tissues. Post-operative shock always brings an interference with the internal respiration, to which the effect of a general anæsthetic may be chiefly ascribed, and which causes, according to Dr. D. Fisher,[2] internal acidosis and asphyxia, with lessened oxidation within the cell. By improving the oxidation it is possible to hasten recovery from shock, and Dr. Fisher has devised a form of treatment on these lines. The diabetic patient has these oxidative processes already impaired when he comes to operation, and is therefore predisposed to post-operative shock. The first reaction of the organism to shock is to mobilise all the available glycogen in the blood stream and distribute it to the cells, but since this supply is soon exhausted it is most important that it should be quickly replenished. Insulin which enables glucose to be administered in an oxidisable form is rational treatment for shock in diabetics and non-diabetics alike.

EARLY LEPROSY IN THE CHILDREN OF LEPERS.

THOUGH leprosy has been known throughout the ages, it remains one of the most puzzling diseases, and there is still uncertainty about some of its most important features. The literature, for example, is still cumbered with innumerable estimates of the incubation period, ranging from a few months to 30 years, whilst the initial lesion, method of invasion, and portal of entry are all still in doubt. This unsatisfactory state of affairs is due to the long incubation period and slow development of the disease, to the failure of attempts to transmit the infection to lower animals, and to the difficulty of gathering observations of the early symptoms in a number of cases large enough to permit of definite conclusions being drawn. Dr. José N. Rodriguez[3] has taken the opportunity to study the early manifestations of the disease in children, some of whom became lepers, and all of whom had lived with leprous parents—most of them continuously since birth. Of 398 children of leprous parents, 59 (14·8 per cent.) were bacteriologically positive; 11 (2·8 per cent.) were clinically lepers, but bacteriologically negative; 97 (24·4 per cent.) had suspicious signs; 231 (58 per cent.) were non-leprous. The sexes were almost evenly represented. The incidence of leprosy was practically identical in both sexes up to the eighth year, but from 8 to 12 there were twice as many males as females. The influence of puberty, naturally more pronounced in girls, is perhaps manifested in the fact that from 12 to 16 years of age the incidence among females rose to exceed the figure for males by 10 per cent. Incidence increased with age—i.e., with longer exposure to leprous parents. The youngest leper bacteriologically positive was a girl 18 months old, in whom the first lesion (macular) had been noted at the age of 8 months. Half the confirmed lepers became bacteriologically positive between the ages of 3 and 6 years, the average age being 5 years and 9 months. In view of the frequent finding of lepra bacilli in the blood of lepers, the possibility of transmission during pregnancy from the maternal to the fœtal circulation was investigated. Sugai and Monobe (1913) found lepra bacilli in four of 12 placentas of leper mothers, and lepra cells in 6 others, and also demonstrated the bacilli in 10 of 12 newly born babies, and in blood of a 17 months old child of a leper mother. D. San Juan (1919) found acid-fast bacilli in globi form in placentas of lepers. In the examination of 15 placentas Dr. Rodriguez found four in which there were lepra bacilli in the cord at the fœtal end, twice in globi form. In only one of these were bacilli found also in the placental tissue. It is evident, therefore, that the bacilli reach the fœtus through the placental circulation in a considerable proportion of cases. This is apt to occur when the pregnant mother develops the so-called lepra fever, with its accompanying bacteræmia. Thus of 19 children of mothers having lepra fever during pregnancy, 3 became lepers; while only 5 children became lepers out of 100 whose mothers did not have lepra fever in pregnancy. Congenital manifestations of leprosy are unquestionably rare; no case was found in the 871 children born at Culion up to 1924, the earliest suspicious lesion being seen at the age of 3 months. Hereditary transmission of a predisposition to leprosy is difficult to prove, and if it exists plays only a minor rôle in the spread of the disease. In the parents at Culion leprosy did not give rise, per se, to an increased incidence of congenital debility in the offspring.

Treatment with chaulmoogra oil derivatives was given to 184 leprous mothers before and during pregnancy, whilst 58 had no treatment; but in both groups half the offspring became lepers. Breast-feeding was not an important factor in the transmission of leprosy from mother to child. Sugai and Monobe (1916) had discovered lepra bacilli in the milk of leper mothers in two cases, but in not one of 45 cases examined at Culion could they be found. Most of the women with infiltrated nipples were sterile, and, indeed, involvement of nipples was more often noted in males than in females. In fact, leprosy at Culion was twice as common in bottle-fed as in breast-fed children; as a rule the latter were in better condition, which shows that the better the health of the child the less its chance of acquiring leprosy when exposed to infection. Although in some cases the itch of scabies undoubtedly served as the portal of entry in leper children, scabies and other skin diseases did not in general predispose to infection with leprosy, and the higher incidence of leprosy was actually found among children who had had no skin disease. Since the leper parents, especially the mothers, are in more intimate contact with their children than is any other person, they are chiefly responsible for infecting their own offspring. Fewer children become infected when the type of leprosy in the parents is neural than when it is the more contagious cutaneous or mixed type. Many authorities contend that there is no initial primary lesion—that the invading lepra bacilli produce no appreciable lesion at the point of entrance; they believe that, once having gained a foothold in the body, the bacilli may remain latent for varying lengths of time, after which, if conditions become propitious, they may multiply to produce manifest leprosy. In favour of this view is the observation of Sorel and Leboeuf that acid-fast bacilli may exist in the lymph glands of apparently normal individuals who have lived with lepers. In the Culion children, however, Dr. Rodriguez found in 75 per cent. of those who became definitely lepers a single initial lesion in the skin, and he marshals data in support

[2] Surg., Gynec., and Obst., 1926, xliii., 224.
[3] Studies on Early Leprosy in Children of Lepers, Culion Leper Colony, Philippine Health Service, The Philippine Journal of Science, vol. xxxi., No. 2.

of his belief that this was the primary initial lesion. In the other 25 per cent. the first clinical manifestations were multiple macules appearing simultaneously or a generalised rash. The commonest sites of the initial lesion were the buttocks, the cheeks, the posterior and lateral surfaces of the thighs, and the loins. The primary lesion was never seen on chest or abdomen, although these regions often showed lesions in the more advanced stages of leprosy. The initial lesion was a solitary pale or pinkish macule, and in three cases this primary macule started from a scabies scar.

Rogers and Muir calculated incubation period by supposing susceptibility to be equal throughout the whole time of exposure; taking half of this period as the average time of infection, they added the time which had elapsed between isolation and the appearance of the first sign of the disease. Using this method, Dr. Rodriguez calculates that the probable average incubation period among the segregated and unsegregated Culion children is three years and nine months. The period of observation of children of lepers segregated after 6 months of age should cover at least five years, for one child developed the first suspicious signs four years and two months after isolation. Segregation of the children of lepers delayed *after* the age of 6 months did not decrease the incidence of leprosy, nor did it delay the appearance of the disease. The removal of children of lepers from a leprous milieu immediately after birth is the only safe prophylactic measure. The experience of the Almona Settlement in India during 30 years, and of the Molokai Settlement in Hawaii during 15 years, has made it certain that such a measure is effective. In both these leper settlements but one child so removed has become a leper. Dr. Rodriguez and the Philippine Health Service are to be congratulated on a valuable contribution to our knowledge of leprosy.

RESEARCH IN ANIMAL BREEDING.

THE Animal Breeding Research Department of the University of Edinburgh has gained an international reputation, and the sixth annual report of its director makes interesting reading, both because it deals with varied investigations and because it describes extraordinarily rapid progress. Although projected as long ago as 1913, the department did not get seriously to work until 1921. Even then it was in very humble circumstances; but it was under the directorship of Dr. F. A. E. Crew, and within these few years the importance of its labours has so impressed the scientific world that the Rockefeller International Education Board offered £30,000 for its development on condition that an equal sum was raised from other sources.[1] The present report contains, by way of postscript, the intimation of a gift of £10,000 from Lord Woolavington. The sphere of work is likely to be enlarged and its educational value increased, and already a number of foreign research workers have been attracted to the school. Much of what is done has an almost immediate application to practical agriculture, but the temptation to be merely utilitarian has been eschewed. To quote the director: "The suggestion that if such and such problems were solved vast sums of money would be saved may be of profound economic interest to the economist and the statesman; it will certainly interest the scientist as a citizen, but it does not constitute the kind of stimulus that provokes him to ardent investigation." Such problems, however, as fertility and fecundity in sheep and studies in the fleece qualities of various breeds and crosses have a great academic interest as well as an obvious economic application. The same holds good of a series of studies in sterility in the horse—studies which suggest that the mode of inheritance of a certain form of sterility is comparatively straightforward. In pigs these problems are being investigated from a different aspect—namely, the breeding of a more prolific stock. During the course of the year several papers have been published on endocrinology, with special reference to the sexual glands, and Dr. Crew has two interesting contributions on the subject of rejuvenation. He has shown that in the fowl unilateral vasoligation does not cause rejuvenation in the senile male—a result which gives no support to the claims of those who recommend the operation for the restoration of mammalian youth. On the other hand, he finds that the feeding of desiccated thyroid to aged fowls of both sexes has definite rejuvenating effects, such as the resumption of egg-laying by the females. These are only examples of the interesting information contained in the director's statement, and we note that reprints of published papers will be sent to any person interested. The unassuming format of the present report is becoming to an institute which is urgently in need of funds.

[1] THE LANCET, 1926, ii., 341.

PYORRHŒA ALVEOLARIS.

THE treatment of pyorrhœa alveolaris, with which Mr. G. B. Pritchard deals under another heading in our present issue, must wait on diagnosis, a truism which only needs emphasis because it is so liable to be overlooked in this condition. The diagnosis of pyorrhœa depends on the recognition of periodontal pockets around the necks of the teeth produced by a process of ulceration occurring in the periodontal membrane. The differential diagnosis lies between it and gingivitis, and all gradations are found between a simple superficial gingivitis and an advanced pyorrhœa existing either separately or together and running either an acute or chronic course. The symptoms are often identical—i.e., hæmorrhage from the gums—either spontaneously or after brushing. They both may produce a purulent discharge from the gum margin, and both are most important causes of oral sepsis. Clinically the manifestations of a gingivitis are superficial, of pyorrhœa deep as well as superficial. An acute gingivitis may produce considerable sloughing of the gingival margin and superficial parts of the adjoining gum, but the alveolar gum cannot be separated to any extent from the necks of the teeth. A chronic gingivitis may produce considerable hypertrophy of the gum margin, which may ulcerate freely, but the pockets associated with it do not descend below the necks of the teeth. An acute pyorrhœa alveolaris may produce paradental abscesses, but although deep-seated they are lateral to the roots and not apical. A chronic pyorrhœa of any length of standing destroys the normal festoon of gum at the necks of the teeth, and produces varying amounts of gum recession; and further still the membrane deep to the receded gum margin is destroyed leaving the pockets between the root and the alveolus, which are diagnostic whether or not there is visible pus. Radiographically, the marginal absorptions of alveolus is little or absent in gingivitis, while in pyorrhœa a varying amount of absorption is always visible with destruction of the superficial compact bone.

THE COST OF DRUGS IN PANEL PRACTICE.

THERE seem to be careless prescribers in Scotland as well as in other parts of Great Britain. The epithet is that of the Dundee Panel Committee which returns in its report for 1926 to the expense to the Drug Fund involved in careless prescribing. It might be more accurate as well as more courteous to use the term elaborate prescribers to indicate those who regard the taste and colour of a mixture as of equal importance with its active ingredients. Leaving out of account modern organic preparations with a few exceptions, such as potassium iodide, the commoner pharmacopœial drugs which are well proved in private and hospital practice are inexpensive, while it is the newer forms of medication whose value may be in doubt which are costly. A consideration of prices, the report remarks, would almost lead one to conclude that the cost of a drug is inversely proportional to its therapeutic value. But it is mere

palatability on which the bulk of money is thrown away. A number of prescribers are not content to add a simple syrup to a mixture but require this syrup to be flavoured with virginian prune or tolu and frequently to be conveyed in a vehicle of chloroform water. The addition of chloroform water to a prescription containing syrup of squills adds 1½*d.* to its cost; and to make up a mixture containing compound tincture of cardamoms with peppermint water costs 5*d.* more than plain water. In a few instances the flavouring agent of a prescription has cost more than the active drug, as in a mixture containing 3 drachms of iron and ammonium citrate made up with orange water, where the salt cost 1½*d.* and the solvent 6*d.* Various devices have been adopted in the local formularies, framed by certain panel committees or groups of committees, to get over the excessive price of such vehicles as chloroform and peppermint water. In these all B.P. aquæ are prohibited and concentrated solutions used instead; chloroform is dispensed in the form of an emulsion. The tariff for all these drugs is based on B.P. or B.P.C. standards and is, of course, part of the contract made with the pharmacists under the Insurance Acts. Separation of the prescribing and dispensing for insured persons was no doubt a wise move, but it was at the same time costly, and it is significant that the cost of drugs prescribed is actually less than the dispensing charge in many insurance areas. The Dundee Panel Committee calls the attention of practitioners to the fact that the great demands on the Drug Fund make it imperative to take every care to avoid unnecessary and wasteful expenditure. The abolition of the placebo would be a great step in this direction, but one which would require the assent of the insured population, and the bottle-of-medicine habit dies hard. In one respect the year 1926 has shown a welcome standardisation in Dundee where the practice of prescribing a 6-ounce mixture in dessert-spoon doses has become practically universal. The report contains much food for thought.

THE SUPRARENAL AND THYROID GLANDS IN PELLAGRA.

Dr. H. M. Shelley's observations on pellagra in Nyasaland, which we publish on p. 74, point to changes in the thyroid gland, with deficiency of thyroid secretion, as the essential lesion in the disease. As a control, it is of interest to note the results of an experimental investigation of pellagra by Dr. L. Karczag. In a first series of experiments his maize-fed guinea-pigs developed loss of hair, gastro-intestinal catarrh, and paralysis, partial or complete, of hind legs. These symptoms, however, were found also in guinea-pigs infected with tubercle. He had concluded that there was no identity between the acute maize disease of guinea-pigs and the chronic human disease, pellagra. In later researches,[1] however, undertaken with Dr. Irene Barát in Budapest, he has been able to demonstrate in maize-fed guinea-pigs, besides a characteristic herpes of lips and nose, definite capillary and parenchymatous changes in the suprarenal glands and red blood-cell destruction and deposition of free iron pigment in suprarenals, liver, and spleen. These lesions occurred equally whether the maize-fed guinea-pigs were white or piebald, or were kept in daylight or in the dark. He notes that in human pellagra Kozowsky had found deposition of free iron pigment in suprarenals, liver, heart muscle, central nervous system, and peripheral nerves, and declared these changes to be especially characteristic of pellagra. There is also a rather close resemblance in many features between pellagra and Addison's disease. Karczag concludes that essentially pellagra is a lesion of the chromaffin system, involving the sympathetic nervous system and the endocrine glands. It will be seen that this is not inconsistent with, but rather in support of Shelley's contention. There remains the all-important question of ætiology. Karczag's animals were maize-fed, but Shelley's observations exculpate maize as a factor in the production of pellagra in Nyasaland.

[1] Wiener klinische Wochenschrift, 1926, No. 50, p. 1449.

THE CURE OF WHOOPING-COUGH.

INNUMERABLE claims have been made for the cure of whooping-cough, but the methods suggested have always proved to have at best only a limited value. Recent articles from different sources recommend two kinds of treatment which are of interest because neither requires the use of drugs and both are based ultimately on the hypothesis that imperfect oxygenation is the cause of the attacks and the disease will end within 21 days if this deficiency is remedied. Dr. E. Pietranera[1] working on lines suggested by Fretin,[2] of Paris, advocates periodical movements of the chest; they may be active or passive according to the age of the patient. The movements are designed to stimulate deep breathing and are repeated every two or three hours. In infants they consist of alternate light compression and relaxation of the lower ribs, as in artificial respiration, whilst older children are taught breathing exercises. Nägeli's method, which consists of applying pressure to the base of the tongue from outside, may be used to cut short the spasmodic attacks, or else the method of Josè Panna, who advocates deep pressure on the epigastrium, rapidly applied and kept up till the attack ceases. Dr. G. Boeldieu[3] claims good results in the treatment of whooping-cough by the means originally described by H. Chatiniere in 1921. Subcutaneous injections of nascent oxygen are given every two days, the quantity being at first 50 c.cm. and later, if necessary, 100 c.cm. Of 18 cases so treated he reports that in 16 the attack ended in 15 days, whilst the other two were cured within three weeks. These results are very similar to those which Dr. Pietranera got by making the children breathe deeply. He, too, treated only 18 cases, but all of them successfully. Like other writers, he lays special stress on the value of open air and recommends treatment at home where possible, because there is a strong nervous element in the disease and children may involuntarily imitate the attacks of others. Of the two methods his is certainly to be preferred as it is simple, needs no apparatus, does not cause pain—an important point with small children—and can be carried out by the older children themselves; in any case deep breathing is probably beneficial to the organism. Treatment by injection of oxygen might, however, be tried in bad cases where the means are at hand and where manipulative treatment is undesirable.

[1] Semana Medica, Nov. 11th, 1926.
[2] Revue de Kinésie, 1902.
[3] Paris Médical, Nov. 27th, 1926.

INDUSTRIAL ALCOHOL AS A BEVERAGE.

DEATH is a drastic punishment for secret drinking. Reports from the New York correspondents of the daily newspapers gravely state that in 1926 about 2000 people died in the United States as a result of drinking so-called whisky prepared from denatured alcohol. Public opinion is now aroused in that country, and apparently there is some likelihood of the industrial alcohol sold there being rendered for the future merely nasty and not deadly. Denatured alcohol, or methylated spirit as it is usually called here, was introduced in 1853 in response to a wide-spread demand for cheap alcohol for industrial purposes, the great cost of alcohol being then, as now, due rather to taxation than the expense of production. It consists of ethyl alcohol rendered unfit for drinking by the admixture of about 10 per cent. of wood naphtha or crude methyl alcohol. Towards the end of the late war a violet colouring matter was also added and "ordinary" methylated spirit, as distinguished from the better kind known as "industrial," contains enough mineral naphtha, or light paraffin oil, to make it cloudy when mixed with water. Methylated spirit as thus composed is

unattractive to most drinkers and is definitely harmful because the methyl alcohol it contains may cause blindness and even death; thus the use of methylated spirit in pharmacy is wisely limited by law, even for external applications. There can be no doubt that from the points of view of revenue and the protection of the weaker brethren the introduction of methylated spirit has been a great success in Great Britain, though most laboratory workers and industrialists would welcome a supply of cheap ethyl alcohol which had not been denatured. It is worthy of note that in this country where wines and spirits are fairly easily obtainable a highly poisonous industrial alcohol would therefore be drunk only by accident, and the Inland Revenue authorities have not seen fit to use anything more deadly than a small amount of wood naphtha and paraffin. A complete denatured alcohol may also contain pyridine bases, pine oil, aniline oil, nitrobenzene, and orthonitrotoluene, whilst specially denatured alcohol may contain brucine salts when it is used for perfumes and toilet preparations. In the United States the Commissioner of Internal Revenue insists that "every package of completely denatured alcohol containing less than 5 wine gallons" must bear under the skull and crossbones the following statement: "Completely denatured alcohol is a violent poison. It cannot be applied externally to human or animal tissues without serious injurious results. It cannot be taken internally without inducing blindness and general physical decay, ultimately resulting in death." This terrifying statement might conceivably be regarded by some people as merely a rather lurid edition of the orthodox teetotal description of ordinary alcohol. It appears that the liquids actually drunk in America are concoctions containing this denatured spirit—but not bearing this label. Thus it is arguable that the Federal Government is to some extent responsible for accidents arising from the bootlegger's activities, because it insists that industrial alcohol shall be very poisonous but fails to prevent it from being disguised as whisky. On the other hand, the Government may very well reply that any citizen drinks whisky at his own risk seeing that the taking of alcoholic liquor is against the law. The risk of being poisoned in the United States, even by whisky which claims British origin, is so considerable that it must keep a large proportion of the population in the narrow path of abstinence. Nevertheless, as we have already remarked, death is a drastic punishment for secret drinking.

GASTRIC SECRETION IN GRAVES'S DISEASE.

THE importance of the sympathetic in the pathogeny of Graves's disease is well recognised. In our present issue we publish an article by Dr. Henry Moll and Dr. R. A. M. Scott incorporating the results of their observations on the secretion of the stomach in this disease. In 50 cases of hyperthyroidism, of which 34 were frankly Graves's disease, they found 22 cases of complete achlorhydria and 15 of marked hypochlorhydria, the deficient secretion being found almost entirely amongst those with true Graves's disease. They found further that in such cases the rate of gastric emptying was exceedingly rapid, so rapid indeed, that very little was to be found in the stomach at the end of a quarter of an hour. Discussing the causation of these findings the authors state that three possible explanations present themselves: First there is the possibility that a gastritis is the cause of the deficient secretion, but this is ruled out by the absence of any excess of mucus. Next they discuss regurgitation of duodenal contents; chloride estimations give some support to this hypothesis, but only in a few cases, and it may be pointed out that complete achlorhydria from such a cause has never been observed, it being very doubtful if any reflux of alkali could keep the secretion of a normal stomach permanently neutralised. Finally, they discuss the importance of inhibition of secretion by the sympathetic. This seems to be the probable explanation. R. Gaultier has satisfactorily demonstrated the excessive secretion resulting from section of the splanchnic nerve; Izod Bennett and J. F. Venables have shown the inhibitory effect of emotions such as fear and nausea in man, and there is in general a mass of evidence pointing to the antagonistic effects on gastric secretion of the vagus and sympathetic nerves. The interesting observations of Moll and Scott provide new evidence of sympathetic action.

THE LEGIBILITY OF PRINT

THE printed word has only one function—to be legible. Designers of type cannot be acquitted of a bias towards ornament or at least towards æsthetic arrangement, and the evolution of printing has not been governed wholly by the principle that the most useful shall survive. It is not impossible, therefore, that certain forms of type now in frequent use are ill-suited to their purpose and by their illegibility place an unnecessary strain on the eyes of countless readers. In 1923 the Medical Research Council appointed a committee to organise and direct research into the legibility of printed matter; the committee consisted of Sir John Parsons, F.R.S., Mr. F. C. Bartlett, Dr. H. Hartridge, F.R.S., Mr. L. A. Legros, Mr. D. R. Wilson, and Mr. E. Schuster, D.Sc. Their scheme of investigation was entrusted to Mr. R. L. Pyke, who has been carrying out work in Mr. Bartlett's laboratory at Cambridge and has written a report [1] which has now been issued by the Council. At first sight the problem seems to present few difficulties, but Mr. Pyke's excellent review of previous work shows at once that it is exceedingly complex. The first stumbling-block is the definition of legibility, which few investigators have attempted; some have ignored the fact that legibility refers to the act of reading performed under normal conditions. Properly speaking a legible type is one that can be read easily under these conditions, but, as Mr. Pyke says, "does 'easily' mean accurately, or rapidly, or both? or does it mean with little effort, and if so, does that mean without eye-strain or without fatigue (both the latter involve some reference to an extended duration in time: accuracy and rapidity do not)?" This suggestion of difficulty in definition is, perhaps, enough to give an indication of the many different criteria which investigators may consciously or unconsciously adopt. These criteria may be objective, subjective, or functional, and in studying legibility in the light of subjective and functional tests the psychological and physiological variations of the human subject are a source of error which is exceedingly hard to eliminate. It would be impossible to give a brief and accurate description of the problems which arose during Mr. Pyke's investigation and of the means which he used to solve them; it is enough to say that they are admirably set out in his report. Experiment was made with a series of eight types and the conclusion was reached that one of these (Lanston standard old style) was probably the most legible, whilst another (Lanston modern condensed) was probably the least. But the reservation is made that these conclusions were true in the laboratory only, and Mr. Pyke is very doubtful whether the relative legibility would hold in the ordinary world. He puts forward the hypothesis, not unacceptable to the uninformed intelligence, that extremely large typographical differences must be present before it is possible to say that there is any difference in the objective legibility of types. "Of types more slightly differtiated," he remarks, "it is impossible to say that one is objectively more legible than another. Such types will be 'legible' according as they suit the psychological make-up of the reader. Hence, the most legible type, in this subjective sense, is unlikely to be the same for all readers. These two ideas—that

[1] The Legibility of Print. By R. L. Pyke, M.A., Medical Research Council, Special Report No. 110. London: H.M. Stationery Office. Pp. 123. 4s.

within limits there is no objective optimum and that only extremely violent changes in the stimulus can produce any significant variation in the reaction—are found in other psycho-physiological fields. For example, it is no longer believed that there is one objectively best way of performing a manual operation in a given industrial process." Anyone who studies his report will agree with Mr. Pyke that the problem is complex and elusive, and many questions have been raised which have not been answered. The practical typographical problems of legibility are still far from scientific solution, and such solution will not be possible until many problems of principle, method, and technique have themselves been solved. Further investigation is now to proceed as a part of a broader study of the physiology of vision and will have the goodwill of all save the cynic who thinks that what is really needed in this world is some means of making print illegible.

FORMS OF MALARIAL PARASITE.

THOUGH many morphological variations of the malaria germs are recognised it is now generally admitted that only three definite species exist as parasites of man throughout the world. Neither the views of Laveran on the unity of the genus plasmodium nor the plurality of the subtertian parasite, *Plasmodium falciparum*, as advanced by Grassi and Feletti, have gained general acceptance. The publication in 1914 by J. W. W. Stephens of a new species of malaria parasite under the name of *Plasmodium tenue* occasioned considerable comment amongst malariologists. The main claims to distinction on the part of this new parasite were the marked amœboid forms, the large size of the nuclear chromatin, and the irregularity in shape of the schizonts. A. Balfour and C. M. Wenyon pointed out at the time that such distorted forms were not uncommon in *falciparum* infections, and on these grounds were unable to recognise *tenue* as a distinct species. Now, in the October issue of that progressive periodical the *Kenya Medical Journal*, J. C. J. Callanan has been able to show, by means of three excellent plates of camera lucida drawings, that *tenue* forms of the parasite can be demonstrated in the same preparations as ordinary "ring-forms" of the subtertian parasite, and that the former are found only in distorted red blood corpuscles which have been subjected to pressure, none being demonstrable in those portions of the blood slide where the cells are superimposed. That *tenue* forms are indeed artefacts is conclusively proved by their absence from fresh preparations of subtertian malaria blood. In *tenue* cases which came to autopsy preparations from the brain and spleen invariably showed parasites identical with *falciparum*. In blood films in which too great pressure has been exerted in their preparation the majority of the *tenue* forms lie in one general direction, at right angles to the edge of the film. The question of the existence of a fourth form of malarial parasite seems thus to have been definitely settled.

Dr. J. M. T. Finney, of Johns Hopkins Hospital, Baltimore, will deliver the Hunterian Lecture to the Hunterian Society at the Mansion House, London, on Monday, Jan. 17th, at 9 P.M. The title of his address will be the Influence of John Hunter on American Surgery.

THE King has approved the appointment of Dr. Munro Kerr, professor of obstetrics and gynæcology in the University of Glasgow, to be Regius Professor of Midwifery in the University, in place of Prof. Murdoch Cameron, whose resignation took effect from Dec. 31st, 1926.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—A clinical meeting of this society will be held at the Miller General Hospital, Greenwich, S.E., on Friday, Jan. 14th, at 8.45 P.M., when Mr. H. Davies, Mr. C. A. Joll, and Mr. P. Bernard Roth will show cases.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCV.—THE TREATMENT OF PYORRHŒA ALVEOLARIS.

THE methods employed in the treatment of pyorrhœa are so various and differ so much in accordance with the local and general conditions associated with it, that it is difficult to indicate any one that is definite and sharply defined.

Advanced Cases.

In the advanced case with a large amount of destruction of the supporting tissues of the teeth, with marked oral sepsis definitely established, and possibly with manifestations of focal infection in other parts of the body, it is impossible to produce any but a slight improvement of the local condition by conservative treatment. Radical extraction of the teeth is the only method which offers any hope of a cure, and even then a low grade infection of the alveolus may persist for years and give rise to a progressive absorption of what bone is left. Locally the jaws remain tender and artificial dentures are badly tolerated. Radiographs show a "feathered" appearance at the margins of the jaws and from these "feathered" patches micro-organisms can be cultivated. Curetting followed by vaccine treatment seems to offer the best method of control.

Early Cases.

In the early case where the peridental infection is confined to the gingival margin, or has spread only to the superficial fibres of the periodontal membrane, conservative treatment offers very fair prospects of success. In the great majority of cases pyorrhœa starts as a localised gingivitis and some time usually elapses before it can spread any distance. Injury, the result either of food stagnation or of mechanical trauma, closely followed by infection, is the main cause of these localised patches, and they are often seen round the lower third molars as they are erupting, especially when the eruption is delayed by impaction or limitation of space. In such cases pressure can be transmitted as far forwards as the canine teeth, resulting in a mechanical congestion of all the gingival margins and so predisposing them to the infection which follows. Crowding and misplacement of other teeth have a similar effect. Mechanical congestion of the gums associated with food impaction is always followed by a gingivitis. Seruminal calculus is then deposited, and acts as an additional irritant; thus a vicious circle is set up and pyorrhœa becomes established. Treatment lies in the removal of the cause of the congestion and the making of the mouth and teeth self-cleansing.

Sometimes the relief of pressure by extraction of the third molars is sufficient; in any case this procedure makes the cleaning of the back of the mouth a comparatively simple matter. For relief of congestion elsewhere, orthodontic treatment, either mechanical or preferably, and if possible, extractive, is employed; as the position of the teeth in the arches improves natural cleansing also improves, stagnation of débris disappears, and, congestion being relieved, the deposition of seruminal calculus is checked. To complete the treatment and generally before the extraction, or during the orthodontic treatment, the calculus and all débris is removed by scaling and polishing. An astringent application such as glycerine and tannin is used for a few days, together with a mouth-wash containing chlorate of potash. In most cases no further treatment is required except a periodical scaling; in all the patient must be taught the necessity of thorough artificial cleaning.

Artificial Cleaning.

The technique for the patient is simple, but it must be carried out with the greatest thoroughness.

A small tooth-brush—soft at first, later medium hard, but never very hard—with discrete tufts of bristles set in serrated rows is used to carry the paste as far as possible on wall surfaces of the teeth; then a piece of dental floss silk or 3-ply worsted is taken and passed through the interdental spaces to clean them with the paste and remove all foreign matter. This done, the teeth are finally vigorously brushed. Twice a day, before retiring and after breakfast, is usually sufficient, but after every meal is ideal. A mouth-wash before breakfast is usually sufficient. It is of little use to employ an elaborate toilet immediately before a meal. An ideal mouth-wash that can be used indefinitely is one containing carbolic acid 1 per cent. and chlorate of potash 5 to 10 gr. to the fluid ounce. It is also advantageous to massage the gum gently with a soft brush wet with weak salt solution. The paste or powder should consist of precipitated chalk containing 10 to 40 gr. to the ounce of powdered soap and chlorate of potash.

Mouth wash.		Tooth-powder.	
Ac. carbolici	℥ii.	Pot. chlor.	gr. xv.
Pot. chlor.	℥i.	Sap. dur.	gr. xxx.
Glycerini	℥i.	Ol. cinnamon ..	℥x.
Aq. ad	℥viii.	Cretæ precip. ..	℥i.

M. for use dilute 1 in 5.

Misplacement of the third molars, upper and lower, and general crowding of the cheek teeth are the most important predisposing causes of pyorrhœa starting at the back of the mouth. Mouth-breathing, and the crowding and misplacement of the anterior teeth associated with it, or arising independently, strongly predispose to pyorrhœa in the front of the mouth. A most intractable gingivitis—usually hypertrophic—arises and speedily develops into pyorrhœa unless the mouth-breathing is stopped and the crowding and associated traumatic occlusion relieved.

Intermediate Cases.

It is with the intermediate cases of pyorrhœa that the greatest difficulties arise. Two methods of treatment are adopted which vary in accordance with the general condition of the patient. In those in which the disease can be considered a purely local one less drastic measures are employed than in those showing evidence of secondary infection. In the first place there is usually a gingivitis sometimes running an acute course, but more commonly a chronic one, which may be: (*a*) atrophic, producing marginal recession; (*b*) ulcerative, due to local irritation by seruminal calculus; or (*c*) hypertrophic, resulting in fibrous overgrowth of the gingival margin and interdental pupillæ. This last type is very common and produces large superficial stagnation areas as the redundant tissue encroaches over the enamel. In other cases, apart from a chronic œdema of the whole of the gum, there is no apparent gingivitis, but the pockets around the roots are deep and exude pus freely.

The first step to take is to clean the mouth thoroughly. There is usually food débris in the stagnation areas, and on the teeth themselves is a soft deposit of oral débris and accumulated secretions, and on the necks a ring of seruminal calculus. Thorough scaling and polishing with the use of floss silk and an atomiser spray in the interdental spaces completes the first stage of the treatment, which is accompanied by a stricter oral toilet on the part of the patient and the use of a mouth-wash. The next step is to remove certain teeth which cannot be made self-cleaning or even be adequately cleaned by artificial measures; the third molars are the ones most often concerned. Of the remaining molars those in which the membrane has been destroyed to or beyond the bifurcation of the roots should be removed. Radiographs of such cases always show the bony septum between the roots rarefied or completely absorbed at its tip, and such an area always forms a septic focus which cannot be obliterated. Of the remaining teeth, again, those in which the pockets extend over one-third of the root, or those that are definitely loose should be removed. This alone, accompanied by improved hygienic methods on the part of the patient, produces a very considerable improvement in the condition of the remaining teeth.

The complete removal of all deposits at the necks and on the roots of the teeth exposed in the pockets checks suppuration. Washing of the pockets, together with astringent massage of the gum, removes secretions, and by promoting a more normal blood flow relieves congestion. Thus the depth of the pockets is reduced by shrinkage of the gum around them. In this way the purulent discharge may be completely stopped and the gum tightened to such an extent around the necks of the teeth that ingress of foreign material is prevented. The pockets do remain, however, although considerably less deep, and are certain to become reinfected sooner or later. It is usual for a general deterioration to take place in the space of a few months and a complete relapse is only a matter of time if treatment is not repeated at very frequent intervals.

Gingivectomy.—A much more lasting result may be obtained by performing the operation of gingivectomy on teeth selected for retention, especially where a hypertrophic gingivitis is present. After the teeth and gum margins have been thoroughly cleaned and the chronic stagnation relieved by massage and irrigation, the redundant gum is cut back to the necks, or beyond if the pockets go so far, under novocaine and adrenalin anæsthesia, given by local infiltration. Healing soon occurs and if the parts are kept clean recurrences are not common, ordinary methods of cleaning being sufficient to prevent further stagnation. Gingivectomy can also be performed where there is no marginal hypertrophy and where the pockets are entirely confined to the roots. Radiographs should always be taken. The most promising cases are those in which there is a sharply defined margin to the absorbed alveolus. Under local novocaine and adrenalin infiltration a horizontal incision is made through the gums on the buccal aspect down to the cementum at the level of the absorbed alveolus to meet a similar incision on the internal aspect. The loosened gum is then removed and the raw surfaces kept constantly washed until they heal. In this way the pockets are obliterated, much larger spaces are left between individual teeth, and natural cleansing is thus promoted. If kept perfectly clean by gentle swabbing with wool soaked in 5 vols. peroxide of hydrogen and the daily use of the atomiser spray, the cut surfaces are readily covered by epithelium without the formation of any redundant tissue. The main disadvantages are the somewhat unsightly appearance of the elongated teeth, and in some cases, the extreme irritability of the tooth pulp due to abnormal stimulation through the exposed cementum.

Ionic medication should be employed in all cases, whether or not gingivectomy has been performed. The use of a variety of astringent solutions in this way materially lessens congestion, checks abnormal secretion, and generally gives tone to the tissues, besides relieving the associated discomfort.

Autogenous vaccines can be used with advantage when associated with energetic local treatment, but they are valueless without it. In acute cases especially the results of local treatment are seen much more quickly than in those in which they are not employed. The possibilities of general infection are rendered more remote and cured cases do not tend to relapse so readily.

G. B. PRITCHARD, M.R.C.S. Eng., L.D.S.,
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PERTH ROYAL INFIRMARY: MATERNITY UNIT.—One of the first separate maternity wards to be erected in connexion with a hospital in Scotland is approaching completion at this institution. It is the gift of Lord Forteviot, and contains 22 beds and the usual accessories.

ENLARGEMENT OF GLASGOW HOSPITALS.—It is hoped shortly to open a new wing of the Victoria Infirmary, consisting of 5 extra wards containing 105 beds and 15 cots. The institution will then accommodate 380 patients, and the scheme includes two new operating theatres and an extension of the nurses' home. The Royal Samaritan Hospital for Women is also being enlarged, and when the work is finished in March the number of beds will be increased from 90 to 160. Here, also, there will be two new operating theatres and an extension of the nurses' home. The two enlargements will cost about £180,000.

Special Articles.

A REVIEW OF RECENT WORK ON MEASLES.*

BY J. E. McCARTNEY, M.D., D.SC. EDIN.,
DIRECTOR OF RESEARCH AND PATHOLOGICAL SERVICES, METROPOLITAN ASYLUMS BOARD.

THE recent decision of the Metropolitan Asylums Board to allot more beds in its infectious hospitals to measles has focused attention on the high death-rate for which this disease and its complications are responsible. Work has been actively progressing in attempts to protect contacts against the infection and also to try and ascertain the causal agent of disease. It is therefore opportune to review the recent work on measles, to ascertain how far we have progressed in the fight against this important and serious menace. It is not possible or profitable to refer to all the published work on measles that has recently appeared, neither in the time at my disposal am I able to discuss fully all the points that I shall raise. I give, therefore, the main facts and conclusions as they appeal to me, particularly from the laboratory standpoint, knowing full well that they will not be universally accepted.

The beneficial results that have been reported from the use of human convalescent serum, and the announcement from the continent that an animal serum can be prepared which acts similarly, have raised hopes that there is now some means of preventing an outbreak of measles in schools and other institutions. The search for the ætiological agent of the disease has been vigorously carried out in recent years, and three independent groups of observers have put forward claims for as many types of organisms, each of which has been thought to be the causal agent of measles. I shall endeavour as far as possible to assess the various claims that have been made and the conclusions reached, and shall refer only to the important papers.

It will be convenient to review the recent work on measles under three headings: (1) The use of human convalescent serum; (2) the use of animal serum (Degkwitz); (3) the various organisms claimed to be the causal agent of measles: (*a*) Caronia's organism; (*b*) Tunnicliff's diplococcus; (*c*) Ferry and Fisher's streptococcus.

The Use of Human Convalescent Serum.

Nicolle and Conseil,[1] in 1918, first published results on the injection of serum from convalescents to immunise children who had been in contact with the disease. Park and Zingher,[2] in 1916, injected 41 children recently exposed to measles.

Since that time numerous observers—Richardson and Connor,[3] Degkwitz,[4] Zimmermann,[5] Blackfan and colleagues,[6] Zingher,[7] Debré and Ravina,[8] Davis,[9] Brügger,[10] Weaver and Crooks,[11] Park and Freeman,[12] Haas and Blum [13]—have published results, and all agree as to the efficacy of human convalescent serum if taken during convalescence and injected in adequate amounts shortly after exposure to infection. By this means an epidemic may be cut short at once. Other observers, as suggested by Debré and Ravina,[8] use the serum to modify the disease to a very mild form, thereby inducing an active immunity.

In the United States Park and Zingher [2 7] have contributed greatly to our knowledge, while on the continent Degkwitz,[4] in Munich, has recorded the results obtained in more than 1000 cases in 1921 and 1922.

The numerous observations reported may briefly be summarised as follows:—

Six c.cm. of serum for children under 3 years of age and 6 to 10 c.cm. for children over 3 years are sufficient to protect from measles if injected within five days of exposure.

Inoculation on the seventh day is uncertain and on the eighth day does not usually protect at all, although if the disease does appear it is in a very mild form and complications are not likely to occur.

The prompt use of the serum will prevent an outbreak from spreading and thus obviate the cases of broncho-pneumonia which have such a distressing mortality.

The immunity conferred by the serum is, of course, only passive and lasts from two to four weeks. After that time the child becomes susceptible again to the disease. The blood should be drawn from convalescents shortly after the temperature returns to normal, 7 to 11 days being advocated by some observers. Antibodies are still abundant in the blood three months after convalescence, but they are considerably reduced in amount. The serum can be stored in the cold for many months without losing its potency.

The method advocated by Park [12] for obtaining blood is as follows:

Adults preferably are used. The blood is taken from the arm vein and run into a 500 c.cm. bottle containing 20 c.cm. of 25 per cent. sodium citrate, and 0·3 g. (equals a final dilution of 1 in 1500) of oxyquinolin sulphate (chinosol) as a preservative. The red cells are allowed to settle by gravity in the ice box or are thrown down by centrifuging, and the supernatant plasma is pipetted off and put up in 3 c.cm. and 6 c.cm. ampoules, and in 30 c.cm. bottles.

Blood for the Wassermann test is taken at the time of bleeding and a sterility control made of the plasma at the time of bottling. A positive Wassermann reaction or contamination of the plasma results in the rejection of the sample.

Modinos,[14] of Alexandria, in view of the difficulty of obtaining blood from small children, advocates the use of a blistering agent, and can obtain 20 c.cm. of serum from blister fluids. He states that children are less liable to be suffering from syphilis or tuberculosis than adults, and that he has never known malarial parasites to be present in the fluid.

The value of convalescent serum has been definitely proved. Given in adequate doses and shortly after exposure to infection it will prevent the onset of the disease, and is of immense value in stopping an outbreak, particularly where a large number of susceptible individuals are congregated together as in schools and orphan asylums. Even if the serum is given in smaller doses or at a later date after exposure to infection, the disease is greatly modified and is mild in character. The rise of temperature is very slight, rarely to 100° or 101° F., Koplik spots are few or even absent, the coryza is slight, and the rash less severe. There is practically no danger of complications and the recovery is certain and rapid. The immunity from such an attack is active and lasting.[15]

Cowley,[16] in an outbreak in an institution, did not have enough convalescent serum to prevent the disease from spreading, but allowed the epidemic to run its course, treating each case of the disease when it occurred with serum from a convalescent. 3 c.cm. were ordinarily administered and 5 c.cm. if the case was severe. The disease was considerably modified, the temperature being quickly lowered, and there were no serious complications.

Serum taken three to four months after convalescence has an effect in modifying the disease, while blood from adults who have had measles in infancy, though not preventing infection, will to some extent render the disease less severe. One of the problems in the use of measles convalescent serum is the difficulty of obtaining a continuous supply of blood sufficient to meet the demands of large cities and institutions. The serum can be taken in practicable amounts only from adults, and the number of these taking the disease is comparatively small and not all are willing to have blood removed. This difficulty will always remain, and in Budapest the mayor of the city has appealed to adult convalescents to give a suitable amount of blood. Another objection raised has been the

* Based on a paper read before the Society of Medical Officers of Health (Fever Group) on Oct. 22nd, 1926.

short period of immunity (two to four weeks) conferred by the injection, and after that time the child again becomes susceptible. While the use of convalescent serum is not the ideal method for overcoming measles, it has a very great value particularly with young people. In children under 3 years of age measles is a very dangerous disease, and the longer the child manages to avoid the infection the less chance is there of complications ensuing when the disease does come. If, therefore, convalescent serum will prevent a young child from becoming infected, it will carry him over a critical period of life to an age when the disease is likely to be less harmful.

It is a debatable point as to the best way of using measles convalescent serum; whether to give large enough doses to prevent the onset of the disease, in which case the protection is only temporary until the passive immunity ceases, or to give sufficient merely to modify the form of the disease so that complications are reduced to a minimum and a lasting active immunity ensues. It would appear that human convalescent serum is beneficial in any stage of the incubation as it will have, if not a protective, then a modifying effect, and its use is a powerful weapon in the hands of the clinician against the distressing mortality-rate.

The Use of Animal Serum.

Degkwitz,[17] of Munich, has produced from sheep a serum which he claims acts similarly to human convalescent serum. Exact details as to the manufacture of this serum have not been published, but it would appear that sheep are repeatedly inoculated with filtrates of nasopharyngeal secretions from measles patients and with tissue cultures inoculated with measles "virus." No attempt is made to isolate a specific agent. It is claimed that the serum from animals thus treated protects children exposed to measles. Degkwitz insists that the serum must be given on the fifth day of the rash of the child responsible for the infection. The serum has been patented in this country and is manufactured on a commercial scale and advertised in Germany.

The reports of the use of this serum have not, up to the present, been satisfactory.

Kochmann[18] injected Degkwitz's serum into 19 children who had been exposed to measles. Of these six did not contract measles, probably because they were already immune. Of the remaining 13 who took measles, two died and one of these had been injected at the time stated by Degkwitz to be optimum. Grave serum sickness occurred in one-third of the cases. Kochmann considers Degkwitz's serum to be a complete failure.

Kaupe[19] inoculated 18 children, of which three children had never had measles, while the remaining 15 had probable, though not certain, history of measles. Injection was carried out as Degkwitz advised—namely, on the fifth day of the rash in the patient causing the infection. The three susceptible children took typical measles, while four of the 15 others had serum sickness. Kaupe advises against the use of Degkwitz's serum.

Noeggerath, Oster, and Viethen[20] have tested Degkwitz's serum and state that it is without protective action if injected before infection. If inoculated at the time advised by Degkwitz the serum seems to have an unfavourable effect. They suggest that details of manufacture and testing the serum should be published and the serum taken off the market.

Seligmann, Dingmann, and Alterthum[21] have used human convalescent serum with success in the Berlin Municipal Asylum for the Homeless and are in a position to compare Degkwitz's serum which they have tried. They point out that it is often impracticable to adhere to Degkwitz's advice to inject his serum on a particular day of incubation, but in any case it does not matter as the serum does not protect.

Recently, Degkwitz[22] states that his animal serum has only been withdrawn from advertising but not for sale. He states that his instructions should be followed exactly and reports good results from various hospitals. From the published results of the use of Degkwitz's serum it would appear that it is of no value. Certainly the mystery in which its manufacture is shrouded, and the absence of any definite ætiological agent isolated, do not inspire any confidence in the finished product. Until Degkwitz produces precise information as to the manufacture and testing of his serum and proves it to have a definite protective effect, it must be regarded as valueless in the prevention of measles infection.

The Various Organisms Claimed to be the Causal Agent.

(*a*) *Caronia's Organism.*—In 1921–2–3 Caronia[23] published the results of his investigations into the causes of scarlet fever and measles. His claims with regard to the latter disease may be summarised as follows:—

> In Tarozzi-Noguchi media under anaerobic conditions there can be cultivated from the blood, bone-marrow, filtrate of nasopharyngeal secretion and cerebro-spinal fluid of children in the prodromal or rash stages of measles, small Gram-negative micro-organisms, round in shape and arranged in pairs like diplococci. Similar micro-organisms can be demonstrated microscopically in the bone-marrow and in the conjunctival and naso-pharyngeal secretions. The serum of measles patients, especially in the rash stage and in convalescence, contains agglutinins, amboceptors, and opsonins specific to these organisms.

Caronia claims to be able to produce a disease resembling measles in young rabbits by intravenous inoculation with blood from measles patients. From the blood of the animals thus infected the micro-organisms can be isolated and at a later date specific antibodies are found. The intravenous injection of large doses of the micro-organism into young rabbits produces a disease similar to measles and which sometimes causes a fatal issue. The infected animals are said to show serological and cultural characteristics very similar to those in the human disease.

Caronia has attempted to immunise healthy children as a prophylactic measure with inactivated or weak cultures. He claims to produce immunity to measles without any reaction. Furthermore, Caronia states that the repeated inoculation of healthy children with large doses of cultures of the micro-organism produces a slight but typical form of measles. Caronia's claims, however, have not been verified.

Shortly after Caronia's original paper appeared I attempted to repeat the work. Numerous modifications of Noguchi media were tried, ascitic fluid, ascitic fluid and broth, broth, human serum, sheep serum, rabbit serum, with and without pieces of fresh rabbit kidney, and pieces of sterile potato. Blood and filtered nasal washings from patients in the prodromal and early rash stages of measles were inoculated into the various media and incubated for periods up to one month. In no instance could any definite organismal structures be found. Films from these cultures stained with Giemsa's stain showed minute round bodies just on the limits of visibility (using a 2 mm. apochromatic lens) and which to the inexperienced might be regarded as organisms. Similar bodies, however, can be demonstrated in the control uninoculated tubes which have been similarly incubated and stained. These minute bodies, which are protein particles, are to be found in media rich in protein and are probably caused by alterations in the hydrogen-ion concentration. They have no bacteriological significance whatsoever and their presence has on more than one occasion led observers to draw erroneous conclusions regarding the ætiology of certain diseases.[24]

I was unsuccessful in obtaining anything which could be regarded as a viable multiplying organism. Experiments on the inoculation of rabbits with blood and filtered nasal secretions were also entirely negative. There were no changes in the leucocytes, temperature, weight or condition of the animal which could be

regarded as pathological. I was unable to confirm any of Caronia's claims.

Selma Meyer,[25] in attempting to repeat Caronia's work, found the small bodies in uninoculated media and in cultures from chicken-pox, polyarthritis, and normal blood. Rabbits injected with uninoculated culture media showed bodies in the liver and spleen similar to those described by Caronia as being specific for scarlet fever and measles in animals. The complement fixation reaction with the "cultures" and rabbit and human sera was not specific.

Meyer [26] injected 13 children with measles "cultures" prepared by Caronia, and also with a vaccine prepared by herself in exactly the same way as Caronia's material. The children were exposed to measles at periods of two to 15 days after the last injection. All the children took the disease and the symptoms were equally typical and no less severe than in uninoculated children. Regarding Caronia's claims to produce measles in children with his cultures, Meyer asked Sindoni (Caronia's assistant and co-author of several papers on measles) to inoculate two children with Caronia's own cultures while she (Meyer) also inoculated two children with "cultures" prepared by herself. None of the four children showed any symptoms. Later three of the four children contracted measles spontaneously.

Takaki [27] cannot confirm Caronia's claims and thinks the alleged "micro-organisms" are due to the autolysis of the added animal organs. The cultures give non-specific results when used as antigen in complement fixation tests with measles convalescent serum. Takaki quotes Hektoen's results showing that minimal amounts of measles blood are infective and the so-called protective results of Caronia are due to the amount of blood in the cultures being sufficient to immunise.

Szirmai and Jacobovics [28] cannot confirm any of Caronia's results.

De Villa inoculated Caronia's organism intradermally and produced a reaction in 65 per cent. of children who had no history of measles. He obtained no reaction in children vaccinated with cultures and in 75 per cent. of children who had had measles.

On the available evidence, therefore, it would appear that none of Caronia's claims can be confirmed or justified.

(*b*) *The Work of Tunnicliff.*—Within the last few years there has appeared a series of papers by Ruth Tunnicliff, of Chicago. In 1917 [29] she reported the isolation of a small round, sometimes flattened, diplococcus occurring in short chains or in clumps which produced small green colonies on blood-agar. This organism was cultivated under strict anaerobic conditions from the throat secretion, but occasionally in the eye and nasal secretion taken in the eruptive and pre-eruptive stages of measles. It has not been found in patients with fading measles eruptions or in diseases other than measles.

The primary cultures—i.e., from measles material, will only develop on blood-agar under strict anaerobic conditions. Growth occurs in five to 15 days, usually about the ninth day, and the colonies are larger if glucose be added. In subculture the organism grows under aerobic conditions. It may then be grown on ordinary agar or in broth although the growth is scanty. It ferments glucose and saccharose, and all strains but one ferment maltose. Mannite and lactose are occasionally fermented but never inulin, salicin, or raffinose. The green-producing diplococcus is non-soluble in bile and does not liquify gelatin. The organism is *Gram-positive*. Recently isolated strains pass a Berkefeld "N" filter and the organism resists drying for 24 hours but not 48. It is easily killed by heat (45 minutes at 57° C.) but survives for 14 days at −0·2° C. and for two months in 50 per cent. glycerin. In the early stages of the disease this diplococcus alone is found in the blood stream, but at the height of the fever other organisms may also be isolated.

Tunnicliff and Brown [30] later showed that opsonins for the diplococcus occurred in convalescent human serum and that complement-fixation tests showed a slight positive. Rabbits inoculated with the organism developed opsonins and agglutinins, the latter often in high titre. The agglutination tests is useful for identification, but the organism tends to be auto-agglutinable.

Tunnicliff and Moody [31] attempted to transmit measles to animals. Inoculation of monkeys with measles material produced, after eight days' incubation, a leucopænia and what were thought to be Koplik spots. In one animal the inoculation protected against a subsequent injection of the diplococcus and in another of measles material.

With guinea-pigs no definite results were obtained.

Experiments were carried out with 46 rabbits as follows: nine were inoculated intratracheally with measles material, 22 with diplococci, and 15 with control organisms.

The authors thought they produced Koplik spots, usually only one. About 85 per cent. of the animals showed a diffuse erythema or maculo-papular eruption which was never so marked as in human cases. The pathology of the Koplik spots produced was said to be similar to that of human cases described by other observers. Rabbits inoculated with the diplococcus are refractory to subsequent inoculations.

In connexion with the attempts to communicate measles to lower animals Nevin and Biltman [32] inoculated blood from measles patients into rabbits. They claim that 33 per cent. of the rabbits showed Koplik spots and 100 per cent. showed eruptions. The authors state that the eruptions were not typical of measles but a general exanthem. The blood count and temperature are not reliable indications of experimental transmission of the disease.

Grund [33] injected nasopharyngeal secretions into rabbits. He claims that 15 per cent. show Koplik spots and 75 per cent. eruptions which are described as a diffuse punctate erythema with a maculo-papular rash.

In contrast with the above results Purdy [34] was unable to find any evidence of transmission when measles material was inoculated into rabbits.

It is not possible to place reliance upon the above findings as the criteria of transmission on which the conclusions are drawn—namely, a general erythema and "Koplik" spots without other manifestations—cannot be termed reliable evidence of experimental measles, particularly with reference to the rabbit. It is well known to all laboratory workers who have used rabbits for experimental purposes that apparently normal uninoculated rabbits may show wide differences from the accepted average standards, particularly with reference to temperature and blood counts. Observers are not all agreed that the transmission of measles to the rabbit has been accomplished.

Tunnicliff [35] has attempted to find a skin reaction for measles analogous to the Dick test for scarlet fever. An extracellular toxin was prepared, diluted 1 in 10, and injected intradermally. It was found that only 50 per cent. of reactions were obtained in individuals who had no history of measles. The toxin was neutralised by human convalescent serum and by immune goat serum, but not by normal goat serum. As the extracellular toxin was not successful whole cultures were next tried. Young anaerobic cultures in dextrose ascitic fluid broth killed by 0·4 per cent. phenol produced a skin reaction when injected undiluted into the shaved skin of the rabbit. This antigen is neutralised by convalescent human serum and by immune goat serum.

For use on human beings the antigen was diluted so that no reaction was produced in individuals who had a history of measles. At this strength (about 1 in 40) reactions were produced in persons not having had measles, but such reactions did not occur in measles patients after the rash, nor in 96 per cent. of persons who had had measles.

Tunnicliff and Hoyne [36] immunised goats with cultures of the diplococcus. The serum was used to try to prevent the occurrence of measles in

children exposed to infection. Only a few children (13 in all) were injected, and the results tended to show that the serum has no power to prevent measles if inoculated after the first two days following exposure. They claim that the serum protects rabbits inoculated with measles diplococcus, whereas controls treated with normal goat serum showed "symptoms characteristic of measles—viz., temperature, Koplik spots, and eruptions." If, however, the protocols of the experiment be analysed, it is found that one rabbit inoculated with an ascitic fluid broth culture of nasopharyngeal secretion had a rise of temperature of 2° F. Another animal showed a rise of 1·3° and a faint eruption, while a third showed a temperature increase of 1° F. and "Koplik spots."

These experiments are few in number and the evidence cited is no proof of experimental transmission. A disadvantage of goat serum is its toxicity.

Hoyne and Gasul [37] have given Tunnicliff's goat serum a more extended trial. Forty-eight infants and children had been exposed to measles, and of these serum was given to 39. Of these 34 were completely protected, while in the other five only a mild form of the disease resulted. No deaths or complications occurred and the temperature was not greatly elevated. The incubation periods were 20, 33, 33, 8, and 16 days. Of the nine contacts who did not receive serum, eight took typical measles resulting in two deaths. Serum rashes, persisting one or two days, were noted in 15 per cent. of all the cases. The passive immunity conferred by the injection of the goat serum is stated to last from two to four days.

Recently Tunnicliff and Hoyne,[39] using the same batch of immune goat serum as Hoyne and Gasul,[37] injected 105 persons with a negative history of measles, but subjected to a definite exposure to the disease. All persons who received serum five days or more after exposure developed measles. The serum prevented measles in 45 per cent. of persons injected on the fourth day after contact with measles patients, and in 97 per cent. of those who received it in the first three days after exposure. From 4 to 6 c.cm. were injected and 12 per cent. of persons showed serum reactions. Measles in children receiving serum was often very mild, but no modification of the disease as described by Zingher [7] and Weaver and Crooks,[11] following the use of convalescent serum, was observed.

These reports on the use of immune goat serum are encouraging and strengthen the claim of Tunnicliff that the green-producing diplococcus is the causal agent of measles.

(*c*) *Ferry and Fisher's Streptococcus.*—Ferry and Fisher,[38] working in Detroit, have isolated an organism the toxin of which they claim is specific to measles. The organism, which was obtained from the blood of patients in the early stages of the disease, is a small Gram-positive *aerobic* green-producing diplococcus, appearing both in pairs and in chains and which produces a soluble extracellular toxin. It differs from the organism described by Tunnicliff in that it is an aerobe growing luxuriantly in the presence of oxygen and "that it produces a soluble toxin specific to measles." The authors are so confident of their claim that they have named the organism "*Streptococcus morbilli*."

Toxin was made by growing the organism in glucose broth, which, on being passed through a Berkefeld "W" candle gave a toxin said to contain 5000 skin doses per c.cm. Ferry and Fisher state that they have proved the "specific relationship of this toxin to the disease and the ætiological relationship to measles of the organism from which it was obtained."

Analysis of their protocols, however, indicates that these sweeping claims are not altogether borne out by the experimental data. For example, they state "Persons with no histories of measles gave positive skin reactions on intracutaneous injections of 0·1 c.cm. of a 1 : 500 dilution of the toxin, showing that they were sensitive to the toxin." Out of 35 tests on persons giving no history of measles only 14 gave positive skin reactions to intracutaneous injections of the toxin. That is, only 40 per cent. gave a positive reaction, and on this result the above conclusion was reached. Surely with a 60 per cent. of negative reactions the very opposite could be stated with equal correctness. The statement "persons giving positive histories of measles did not react to intracutaneous injections of the toxin" is based on 30 injections in children with no positives and in 30 adults with two positives. One feels that these numbers are not sufficient to warrant so sweeping a conclusion. Ferry and Fisher state that "patients in the pre-eruptive and early stages of the disease gave positive skin reactions to the toxin, while those in the later stages and especially convalescents, gave negative skin reactions." They naïvely add "in hospital practice it is almost impossible to find a case of measles in the pre-eruptive stage, but of 15 cases obtained as early as possible seven gave positive reactions and none of the late and convalescent cases, 24 in all, reacted to the toxin."

The statement that positive skin reactions occur in the pre-eruptive and early stages of the disease is based on only seven positives out of 15 cases—i.e., less than half, coupled with an admittance that they have not tried out the test on patients in the pre-eruptive stage of the disease. Their statement that "when mixed with convalescent serum the toxin will not produce a positive skin reaction in susceptible persons" is very much modified in the next sentence when they say "in most instances the reaction was negative." This is a very vague statement from which to draw so important a conclusion.

Ferry and Fisher report that the toxin is neutralised by an antitoxin prepared from animals by the injection of toxin, and that when mixed with scarlet fever antitoxin or normal horse serum the toxin is not neutralised. Persons showing positive skin reactions with the toxin were made to give negative reactions by injection of measles convalescent serum. A person showing a positive skin test was made negative by the injection of serum from an animal immunised with the toxin. As the test was only carried out on one person it is an interesting fact to record, but no definite conclusions can be drawn from a single experiment.

The statement that "serum of measles convalescent patients agglutinates suspensions of measles streptococcus while negative serum does not" was based on an experiment in which serum, pooled from several convalescent cases, was tested with four strains of measles streptococcus. Only two of the four strains were agglutinated although the serum was from several patients and, therefore, more likely to give a higher percentage of positive results; 50 per cent. of failures does not warrant a statement which indicates 100 per cent. of results.

The authors also say that "intracutaneous injections of live cultures of our organism produced severe local infections surrounded by large areas of hyperæmia, which at times extended over the entire abdomen and back, appearing very much as a typical measles rash." Their account of the protocols on which this definite statement is based is as follows: "About 0·1 c.cm. of broth culture was injected intracutaneously and within two days there appeared a large raised area, about 4 cm. in diameter, which next day resulted in an abscess with sloughing. One rabbit showed a distinct redness over the entire abdomen and back while others were more or less hyperæmic." As a living culture of streptococcus was used, it is not surprising to learn that there was an abscess with sloughing. "Distinct redness of the abdomen and back" cannot seriously be construed into a "typical measles rash." Similar results would have been obtained if any other virulent streptococcus had been used. Similarly, killed cultures would also produce severe inflammatory reaction with the formation of a sterile abscess. The work of Ferry and Fisher is described as a preliminary report and doubtless full details will shortly be available. From the point of view of the laboratory worker, I do not think

that the conclusions are justified from the evidence brought forward.

Conclusion.

In this review I have attempted to assess some of the recent work on measles as the facts and conclusions appeal to me. The problem of the ætiology of measles has not yet been solved and more critical and convincing experiments are required. The work reviewed above is a step in the right direction and it is gratifying to know that active research is being carried out by numerous workers in many different countries. Summarising, therefore, convalescent serum has a very definite prophylactic and also therapeutic value, but owing to the difficulties of obtaining an adequate and constant supply its use is limited. Up to the present the reports on the uses of Degkwitz's serum have not indicated that it has any specific value. With regard to the claims of various observers concerning the causal agent of measles, the work of Tunnicliff, in my opinion, deserves consideration.

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INDUSTRIAL RHEUMATISM.

PROPOSED CLINIC IN LONDON.

THE following memorandum, issued on behalf of a subcommittee of the International Society of Medical Hydrology, gives a brief outline of the extent and nature of industrial rheumatism and suggests principles for its treatment at a clinic in London.

Incidence and Causation.

The information now available as to the prevalence of rheumatic diseases among industrial workers ("industrial rheumatism") reveals a remarkably uniform incidence in northern European countries. It appears that "rheumatic diseases" (as defined by the British Ministry of Health) are accountable for about one-sixth of the total invalidity of insured persons in England, Sweden, Norway, and Denmark. Next to the infirmities of age, arthritis alone is regarded in Sweden as the most serious cause of disablement. As regards the incidence of the different forms of rheumatic disease the British report[1] shows that out of 20 cases six may—roughly speaking—be described as lumbago, four muscular rheumatism, two sciatica or brachial neuralgia, two rheumatoid arthritis, two osteoarthritis, two subacute rheumatism, one rheumatic fever, and one gout. But, although arthritis is accountable for only a small numerical minority of rheumatic cases, the invalidity arising from arthritis is "tedious, painful, and costly," and actually causes as much incapacity for work, and, therefore, economic and financial loss, as muscular rheumatism, fibrositis, lumbago and sciatica combined.

Like rheumatic fever and subacute rheumatism, chronic rheumatic affections of the joints and soft tissues are caused (in part) by climatic influences. Damp houses, the proximity of underground streams, certain localities and aspects, seasons of the year and types of weather increase the incidence of all these diseases. They are much less prevalent in dry, warm climates. Focal infection has been demonstrated in very many cases of arthritis, but the body may habitually give lodgment to many kinds of possibly-infective organisms. Chilling of the body is one of the chief determining causes which enable these specific causes or agents to become infective. For this reason chill ranks high, in cold and temperate climates, as a cause of disease—rheumatic, catarrhal, tuberculous, &c. Habit and occupation are also determining factors, and Dr. van Breemen has said that "every occupation has its own rheumatism."

Need for Extended Facilities for Treatment.

The inability of the spas to deal adequately with the vast number of rheumatic cases that require hydrotherapeutic treatment renders it essential that more extended facilities of this nature be made available. There is an urgent need for centres of physical treatment in the large centres of population, such as already exist in continental towns. In Berlin, Dresden, Hanover, Vienna, Amsterdam, &c., thousands of insured persons are treated near their own homes, many of them coming for treatment after working hours. The same methods are employed at the Bispebjerg Hospital in Copenhagen and at the Board of Pensions' institutions in Sweden. It may be noted that the curative value of diaphoretic drugs points to the activity of the skin as a normal avenue of relief in rheumatism and that heat is the most powerful of diaphoretics.

On the preventive side it is to be hoped that pit-head baths and similar facilities for factory workers will be extended. If properly organised they will undoubtedly form an important aid in prophylaxis. The efficacy of hot baths for the immediate relief of chill and over-fatigue was amply demonstrated in the war.

The Ministry of Health has recently outlined a service for the medical care of industrial rheumatic cases, including three different types of institution:—

"A *Physical Treatment Clinic* would serve as a clearing house directing patients to the form and place of treatment best suited to their need, some to spa treatment, some for intensive study at an *arthritis unit*, whilst others would be greatly benefited by treatment at the clinic itself. These clinics would be out-patient institutions, to supply those forms of physical treatment which are so often necessary for the

[1] The Incidence of Rheumatic Diseases, Ministry of Health, 1924. It must be remembered that the Report refers only to insured persons. Insured females in England and Wales do not afford a representative sample of the female population of the same class, as the younger age groups are much over-represented, so many women falling out of insurance on marriage. A true sample would show a somewhat higher proportion of chronic arthritis cases.

re-education of muscles and joints, and generally for the after-treatment of these diseases when the active stage has passed. They should be organised in close coöperation with an arthritis unit and with *the spa hospitals*, and provide continued supervision, observation, and after-care, following institutional treatment. Such clinics would be also of great service in diseases and conditions other than rheumatism, such as fractures, deformities, and diseases of the nervous system."[2]

As the physical clinic is the first link in the chain and should suffice for the immediate treatment of large numbers of cases, it is desirable to define its precise character, objects, and methods.

Proposed Physical Clinic in London.

(1) The basis of the treatment at the clinic, primarily for rheumatic cases, is heat and light, combined with movement and manipulation. It is held that both heat and movement are best conveyed to the body in water and that the manipulation bath is especially suitable for rheumatic cases. Hot air, vapour and electrical stimulation are valuable adjuncts. Great importance is attached to the sequence of physical impressions.

(2) The object of moist heat, manipulation, &c., is to relieve pain, stiffness and swelling, by a sedative action on the nerve centres and by increasing the blood and lymph circulation.

(3) A complete or combined physical treatment consists in a combination of two or more of the following procedures: (*a*) Either a hot manipulation pool or local bath (whirlpool, hot air, &c.) or dry manipulation; (*b*) a warm sedative pool, similar to the war-time pools; (*c*) light baths; (*d*) stimulant douches and friction baths; (*e*) remedial exercises; (*f*) electrical stimulation.

(4) It should go without saying that the clinic must be under the direction of a medical man who has had special experience in the various forms of treatment employed. Other necessary features are full clinical investigation and classification of cases, measurements of disability, records of treatment employed and reactions produced, tabulation of results.

(5) It is believed that a clinic of this character can be used: (*a*) For systematic preventive treatment in chill and over-fatigue; (*b*) in all apyrexial rheumatic diseases, both of the joints and soft tissues, accompanied by pain, stiffness, and swelling; (*c*) in many pyrexial cases, after the fever has subsided; (*d*) for periodical alleviation of incurable cases so as to enable arthritic persons in particular to continue in their occupations; (*e*) for non-rheumatic cases, cardiovascular or nervous, &c., for which physical treatment is indicated.

(6) It is proposed to establish in London a physical clinic on these lines for insured rheumatic persons. A minimum of 200 cases per day is regarded as an economic unit, the installation to be arranged so as to be capable of dealing with 400 cases per day. It is intended that the work of the clinic should be carried on in full coöperation with research work, with surgical and orthopædic hospital departments, and with the spa hospitals.

This memorandum is signed by Dr. R. Fortescue Fox, Dr. R. L. J. Llewellyn, and Dr. M. B. Ray.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

The Sick-Clubs and their Doctors.

AN unpleasant surprise has been sprung on the profession by the Government. Everyone in Vienna who works for wages—that is to say, everyone who receives regular weekly or monthly payment—is obliged to belong to one of the three large institutions (*Krankenkassa*) which provide free medical aid and sick pay for their members, and in each of the provinces there are two or three large and independent institutions of the same kind. Such is the political condition of this country that most of these institutes have elected Social Democrats to their managing boards, and as the electorate is very evenly divided between the Social Democrats and their reactionary opponents, the Christian Socialists, many people have found themselves, against their will, in Socialist institutes. The Government has now attempted to break the supremacy of the Socialists in the *Krankenkassa* by bringing before Parliament an Act enabling the formation of new sick-clubs, to be called *Wahlkassen*, or alternative clubs. The plan is that everyone shall be allowed to choose the institution to which he shall belong, and any body of 1500 members will be entitled to form a new club. This means that the old-established sick-clubs—with anything from 50,000 to 180,000 members each—will be broken up, numerous small clubs suddenly appearing in their stead. Naturally the interests of the doctors and the patients cannot be served by such small organisations. Whereas the funds accumulated by the big institutes insure both patients and doctors against undue risks and guarantee their fees and old age pensions, the small number of members of the new clubs means an increased risk of morbidity and a loss of all guarantee. It is recognised by all insurance companies that the broader the base—i.e., the bigger the numbers of members—the less the risk of failure. But here the Government is working in the face of this principle; it is going to narrow the base, and thus increase the risks. If the big institutions lose members they will have to dismiss doctors, and this will mean unemployment for a certain number of medical men whose only source of income is their work for the sick-clubs. But what causes even more annoyance is the fact that the Government—or rather the political parties forming it—have worked out their scheme without so much as asking the opinion of the profession, which has simply been faced with a fait accompli. There cannot, however, be any sick-clubs without doctors, and as unanimous repudiation of the *Wahlkassen* was expressed at several mass meetings last week, there are strong reasons for hoping that the plan will come to nothing. The public, or rather the prospective members of the clubs, are also able to understand that a large, powerful, well-established, and rich organisation is much better able to look after its members than a new, poor, and small body.

Whilst I was writing this, news reached the leaders of the profession that the Government intends to meet the demands of medical men by laying down in the Act the principle that all the rights of doctors serving the existing clubs must be secured before any branch club is brought into being. The profession has therefore resolved for the present not to carry out its threat of a medical strike, and is adopting the policy of "wait and see."

Cancer of the Nose.

At a recent meeting of the Vienna Medical Society Dr. G. Hofer demonstrated four patients who have remained cured for long periods after operation for nasal cancer. Working in coöperation with Dr. Kofler, he discarded the methods previously used in treating malignant disease of the nose, and resolved to remove all the diseased tissue, commencing with an incision above the orbit or at the fossa canina or approaching the nasal structures with Langenbeck's incision, according to the situation of the tumour. The entire mucous membrane of the nose and the accessory sinuses are removed and operation is immediately followed by application of a large dose of radium, which is well borne by the nasal tissues. Dr. Hofer now uses very big doses—viz., 2900–3500 mg.-hours in continuo. Cancer of the nose has long been regarded as an absolutely fatal disease, and statistics show that until 1914 only 2 per cent. of patients remained free from recurrence a year after operation. The metastatic growths are late, but local recurrence is very common. Of the four patients demonstrated by Dr. Hofer and Dr. Kofler, one, who is 68 years old, has had no return of the growth during nine and a half years; another, aged 67, who

[2] THE LANCET, Nov. 6th, 1926.

received 5000 mg.-hours of radium, has been free for nine years, whilst the other two, aged 59 and 72, were operated on four and a half and four years ago respectively. Of three other cases treated in the same way two have died from intercurrent diseases and the third cannot be traced. The patient treated with the excessive dose developed a late necrosis of the bone over an area the size of a shilling. In view of this sequela Dr. Hofer and Dr. Kofler resolved to decrease the dose to 3500 mg.-hours in continuo, and with this dose no untoward results have been noted. As the prognosis is extremely bad in all cases of oral and nasal cancer these results are very remarkable and gratifying.

On behalf of the Senate the Rector of the University of Vienna has lodged a formal protest with the Ministry of Education against the conferment of the title of professor on Dr. J. Bonvicini and Dr. R. Bauer. The titles were given without the advice and presentation of the medical faculty of the University, and the incident, though in itself unusual, well shows what impossible conditions prevail in the University as regards the titles of professor or docent. Though the latter rank is not very closely protected, the coveted title of professor is seldom recommended without long deliberation by the Academic Senate, three or four men being presented as candidates for each post. As a rule the Ministry of Education falls in with the suggestions of the Senate, but it is not absolutely bound to do so.

Dr. Arnold Durig, professor of physiology in the University of Vienna, has recently been invited, for the fourth time, to occupy the chair of physiology at Berlin. In spite of the very tempting offers, however, he has again decided to remain in Vienna, though the remuneration offered by the Austrian Ministry of Education is relatively small. His attitude has given great satisfaction to the Viennese students, by whom his ability as a teacher is fully appreciated, and this satisfaction is shared by all who recognise in him one of the leading physiologists of Europe.

PARIS.

(FROM OUR OWN CORRESPONDENTS.)

The Recent Census.

THE census returns have just been published, and it is found that of a total of 40,743,000 inhabitants of France 2,500,000 are foreign. In the department of the Seine, which includes Paris, foreigners constitute 10 per cent. of the population. The large influx into France is a source of anxiety to many economists who hold that immigration should be limited and that artificial conditions of monetary exchange should be corrected without delay. In the department of the Seine applicants for naturalisation will in future have to undergo a medical examination.

Testicular Grafts.

E. Retterer has lately presented to the Société de Biologie a description of the changes occurring in a simian testicular graft implanted in human testicle three and a half years ago; a second graft was made when the remains of the original graft were removed for examination. It was found that tubules of epithelial cells were becoming converted into fibrous cords and that the portion of intertubular masses lying next the tubules was reticular in structure, regions more remote being transformed into a mucoid tissue. The epithelial elements of testicular grafts become slowly converted into fibrous tissue, the internal secretion supplied by the graft remaining active only as long as the epithelium survives.

Remuneration of Medical Practice.

Just at present certain medical fees in France cannot be demanded without some difficulty, because efforts are constantly being made by the State and by social insurance organisations to lower them. Official agencies of this kind offer very small remuneration for the treatment of war pensioners and cases of occupational sickness and accident. The result is that many prominent medical men refuse to treat any cases of this kind, protesting that the fees offered do not allow them to maintain a respectable professional existence. The tendency described, together with a movement, seemingly extending, towards general utilisation of public hospitals by persons amply able to pay for professional service, is adding seriously to the burdens borne by the French physicians.

Medical Examinations.

As already mentioned, a recent decree of the Faculté de Médecine made it necessary for candidates who had been rejected in one part of a medical examination to sit again—at the end of a year—for the whole examination, unless they had been able to secure a general average of 70 per cent. of the possible marks. The sudden introduction of this rule meant that many students would unexpectedly have to spend an extra year before qualification, and the National Union of Students' Associations protested vigorously to the Ministry of Education. The Ministry has accordingly decided to suspend the new decree during the present scholastic year.

Prof. A. Pinard and his associates are bringing before the Chamber of Deputies a Bill making the presentation of a medical certificate, attesting the absence of contagious disease, obligatory for the legalisation of marriage.

At a meeting of the Académie de Médecine on Dec. 28th Prof. J. Camus laid stress on the importance of preventing entry of small-pox into France, especially from Algeria. Arabs from that country have recently been responsible for epidemics at Paris, Douai, Valence, and other French towns. During the past three months a number of cases have been isolated in Paris at the St. Louis Hospital and conspicuous municipal posters advise resort to the free vaccination stations.

On Christmas Eve Prof. Léon Bernard, of the Faculté de Médecine, was severely injured in a motor accident. His condition is stated to be improving.

MEDICINE AND THE LAW.

The Witness for the Crown.

THE Leigh and District Medical Society passed last month a resolution recording its opinion that "in cases where criminal proceedings are instituted against medical men, expert evidence should be obtained by the Home Office from men specially competent to deal with the department of medicine, surgery, gynæcology, or other special subject concerned." The resolution is understood to be a sequel to the recent criminal proceedings at Manchester Assizes where two medical practitioners were acquitted on a charge of manslaughter. It will be recalled that an important question of fact for the jury to decide was whether or no there had been an illegal operation upon the dead woman. Upon this issue Sir Bernard Spilsbury was called by the Crown to state the result of his examination of the body and to express his opinion how far what he found was consistent or inconsistent with the allegation of criminal abortion. His evidence, and especially his inferences, met with a vigorous challenge from gynæcologists and other specialist practitioners called on behalf of the other side; and the defence invited the jury to remember that the expert called by the Crown possessed no special knowledge or experience of gynæcology and that therefore his evidence had the less weight. The principle now put forward in the Leigh Society's resolution, if endorsed by the medical profession generally, will doubtless engage the attention of the

Home Office. But whether the resolution is regarded as in the interests of the public or in the interests of the profession, it is unlikely to lead to any change of policy. The Home Office and the Director of Public Prosecutions have adequate facilities for summoning whatever expert testimony maybe required.

English traditions do not encourage the practice of straining every nerve and employing every possible resource in the endeavour to obtain a verdict of "guilty" at all costs. The duty of the prosecution is not to press for a conviction but to present the facts fairly to the court and jury. The Home Office may show itself reluctant to select a large standing panel of medical and surgical specialists to enter the witness-box on behalf of the Crown whenever similar experts are likely to be called for the defence. In so far as the view of the legal profession is material, it would probably be against change. Prosecuting counsel are content to rely—as in the case of the dispute over the criminal responsibility of Ronald True—upon available official or semi-official witnesses giving their evidence with fairness and restraint. The defending barrister will hardly desire a change if it means that he will lose the advocate's legitimate weapon of pointing out to the jury that both in weight and number his own witnesses are superior to those of the Crown. Viewed, indeed, from the angle of the legal profession, the proceedings at Manchester ran a normal course. Both the magistrates' court and the coroner's court felt reasonably satisfied that there was a prima facie case for investigation at the assizes; at the assizes the defendants were satisfactorily acquitted, the jury evidently accepting the accounts of the occurrence given by the accused themselves, and attaching weight to the other evidence for the defence. The placing of professional men in the dock on charges which are not substantiated is, of course, regrettable; it is by no means clear, however, that the recent trial at the Manchester Assizes would have been avoided by adopting the principle for which the Leigh and District Medical Society contends.

The Legitimacy Act, 1926.

The date of commencement of the new Legitimacy Act was wrongly stated in this column in THE LANCET of Dec. 25th (p. 1341). The Act is not postponed to July 1st but took effect at the beginning of the present year. In one sense the error was less serious because in its broad outlines the new legislation is retrospective, so that legitimation by subsequent marriage has become possible whether the marriage took place before or after the commencement of the Act. But in three other respects the date of the operation of the Act is vital. To begin with, the parents of a legitimated person must furnish the Registrar-General with information with a view to re-registering the birth of the legitimated person by a date which depends upon the date when the Act came into force—i.e., if the marriage takes place after Jan. 1st, 1927, then within three months of the date of marriage, but if the marriage took place before the commencement of the Act, then within six months of such commencement. Secondly, the new right of an illegitimate child and an illegitimate child's mother to succeed to one another's property if the other dies intestate will operate only where death occurs after the commencement of the Act. Finally, the new law contains an express saving that nothing in the Act shall affect the operation or construction of any disposition coming into operation before the commencement of the Act or affect any rights under the intestacy of a person dying before such commencement. For these reasons it is particularly necessary to bear in mind that the date of commencement of the Act was Jan. 1st, 1927, and the misstatement in a previous issue is the more regretted.

TUBERCULIN DISPENSARY BENEVOLENT SOCIETY.—The Tuberculin Dispensary at 32, Fitzroy-street, London, W. 1, will in future be open on Mondays and Thursdays from 2.30 to 5 P.M.

Public Health Services.

A LABORATORY SERVICE FOR LANCASHIRE.

THE Lancashire Insurance Committee have formulated a scheme for assisting insurance practitioners in the scientific treatment of diseases which call for prompt pathological and bacteriological services, and for simplifying the administrative procedure where stock and autogenous vaccines are required. An insured person is entitled, as part of medical benefit under the Insurance Act, to proper and sufficient drugs (including vaccines) requisite for the treatment of his case. This provision does not, however, extend to laboratory diagnostic services. If an autogenous vaccine is to be prepared, then under the old procedure the insurance practitioner selects the source of supply, obtains a collection and transmission outfit, and pays the laboratory authorities. He afterwards sends the receipted bill to the Insurance Committee, together with a pro forma prescription, when the cost is reimbursed to him. The large increase in the use of vaccines, and numerous inquiries received by the Committee from insurance practitioners in Lancashire, have emphasised the desirability for a simplification of procedure, and of relieving insurance practitioners of much correspondence, payment of fees, and other clerical work at present unavoidable. Arrangements have accordingly been made with the Wigan Infirmary (Pathological Department), which is in charge of Dr. W. E. Cooke, to supply stock and autogenous vaccines to the order of insurance practitioners, and to report upon any material sent for examination. Insured persons as such are not entitled to laboratory diagnostic facilities, but it is understood that the Wigan Infirmary Board is prepared to furnish free of cost the diagnostic reports required for these persons. Free outfits are being provided for the collection and transmission of material. Should an autogenous vaccine be required, the necessary material is to be sent accompanied by brief details on the form provided, and a pro forma prescription on the usual official form. Where a stock vaccine only is required, all that need be sent to the Wigan Infirmary is a prescription on the official form. Payment will be made direct to the Infirmary Board by the Insurance Committee. It is clearly stated that the scheme does not supersede existing arrangements for the supply of vaccines, but should be regarded as an alternative provision to be used at the option of the insurance practitioner. The scheme came into operation on Jan. 1st. The laboratory is open day and night, and urgent examinations can be made at any time.

In calling attention to this new service the Insurance Committee reminds practitioners in Lancashire that certain pathological and bacteriological services are provided free out of public funds through public health authorities, chiefly in connexion with tuberculosis, venereal diseases, diphtheria, and the typhoid group of fevers. Where practitioners have been notified of these services they should be used and specimens sent to laboratories with which the district local authority has made arrangements, when the fee will be paid direct by the authority to the laboratory.

PORT SANITATION.

THE annual report of the Surgeon-General of the United States Public Health Service refers to the new plan by which emigrants to the States are inspected at European ports. This inspection is regarded as an unqualified success though "a severe drain on the medical personnel of the Service, both on account of the number of officers needed and the special training required." At present 28 regular medical officers of the Service are on duty in Europe in the following countries: England, 4; Ireland, 5; Germany, 8; Scotland, Norway, and Sweden, in each, 2; and 1 each in Poland, France, Holland, Belgium, and Denmark. From the point of view of emigrants and the medical officers of transatlantic liners the new

plan is obviously an advance. It is part of a general movement throughout the world towards efficient port sanitation and simpler quarantine procedure. The port medical services employ few officers, but are immensely important; every year an enormous amount of work has to be done to prevent the admittance of infectious disease into this country from abroad. Some idea of the scope of the work may be gleaned from the following summaries of activity at Liverpool and Bristol during 1925.

Port of Liverpool.

Dr. A. A. Mussen mentions that 6650 inspections of ships were made and 995 had nuisances on board, more in the foreign-going than in the coastwise section, more in British than in foreign ships. To prevent the importation of infectious disease, ships from ports deemed infected and ships with known infectious disease on board are visited before docking by an assistant medical officer; all ships are visited by a sanitary inspector as soon as possible after docking, and everything possible is done to diminish rats and to find plague infection amongst them at once should it arise. It is now under consideration whether captains should not report by wireless if they have cases of sickness on board, in order that all such ships may be visited by a medical officer. During the year 191 cases of infectious disease were landed at Liverpool, among them one case of small-pox was found in an outward-going steamer; 13 cases of typhoid fever, 4 of paratyphoid, 19 of malaria, 64 of tuberculosis (the majority were passengers), and 5 cases of anthrax occurred in the area. Rat plague, apt to remain long latent, is always being sought in ships, by inspection, by careful sampling of the rats all over the ship, by watching for dead or sick rats during cargo discharge; and on the docks, by trapping and preventing harbourage by quick removal of refuse, by cleanliness, and by raising temporary wooden offices 18 in. above the ground. Dead rats are examined by the city bacteriologist for plague, but it was not found in any case in this year. Fumigation of a ship is asked for if many rats are found; it is rarely necessary to fumigate every six months. Much may be done when a ship is building towards making her ratproof; a new improved rat-guard for hawsers, devised by Dr. C. F. White (THE LANCET, 1925, i., 695), has found approval. Fumigation was done on 112 ships with SO_2, in 21 with HCN, in every case the whole ship being fumigated at one operation. Fewer rats were caught this year than last, the reward, we may hope, of perseverance. On ships 11,088 rats and mice were caught by the official rat-catcher, from the quays 2508. In all 61,117 rats were taken at 13,000 visits in the port and the city, and as usual nearly all those caught on board were black; most of those on the quays and in the warehouses were black, but in the sewers there was hardly a black rat; almost all were brown. The Minister of Health visited the port and was shown the methods of killing rats and fleas, including the methods of fumigation. Zyklon, a mixture of 97·5 per cent. of hydrocyanic acid with 2·5 per cent. tear gas, soaked up in kieselguhr, is reported very effective in concentration of 0·15 per cent. HCN for two hours. Thorough after-ventilation is essential, and the tear gas is not thought to be a complete safeguard. At the city clinics for venereal cases there were 2386 new cases, at the Seamen's Dispensary 1084; total attendances were 43,359 and 27,265, which seems to suggest that the seamen attended more persistently. Of every seven cases two were syphilis, one soft chancre, and four gonorrhœa. Ships are said to be cleaner than formerly, sanitary fittings are better and better respected, and the men complain more readily of infestations. Yet more nuisances are reported this year than in 1924—2701 dirty forecastles and 681 foul water-closets. Aliens to the number of 21,613 were inspected and 10 certificates of rejection issued. A medical inspection room is wanted. Verminous emigrants were dealt with at the city hospitals. Meat inspection is much simplified under the new regulations; 1192 tons of meat were condemned as brine-stained or decomposed, and destroyed or released for industrial processes; similarly 845 tons of fruit and 6085 tons of cereals. Cheese in a closed hold for six days caused CO_2 poisoning of two men who recovered; preliminary ventilation will be done in future. All second-class and steerage passengers outward bound are inspected by the Board of Trade, and all crews on ships going to America. An inspector of the Port Sanitary Authority attends these inspections to supervise the removal of all who are rejected for actual or suspected infectious disease. In 231 inspections 23 persons were rejected—5 for measles, 4 for scabies. Three cases of trachoma were found in transmigrants.

Port of Bristol.

Dr. D. S. Davies reports that Bristol Port lost her launch by sale in 1912, and her port hospital ship by collision in 1916, and that neither has been replaced. Infected and suspected ships are visited in the roads by a hired tug; other ships are visited on arrival in the docks by the sanitary inspector. If there are infectious cases on board or if the ship comes from infected ports the medical officer is informed and visits. Cases are then removed to the city hospitals, disinfection and other necessary measures being carried out. In 1925 20 cases of infectious disease were dealt with—8 of malaria, 6 of enteric fever, and 3 of tuberculosis. Four cases of beri-beri, in Indians from Australia, were sent to the Royal Infirmary, and 2 cases of (tertian) malaria to Ham Green Hospital. The assistant medical officer performs duties under the Dangerous Drugs Act. During the year 2267 ships were inspected, 34 ships were fumigated, 1 with HCN (no rats), and 33 with sulphur (35 rats per ship); 11,626 rats were caught or found dead, about one-fifth on ships; 116 of these were examined, but no plague rats found. The chief defects on ships were dirty forecastles and foul closets. 191 (8·4 per cent.) ships had defects, more numerous in foreign (10·5) than in coastwise (3·7) ships, and in foreign-owned (8·5) than in British (8·2) steamers. 2225 dirty or infected beds were destroyed. One ton of meat, 11 tons flour, 20 tons wheat, and 21 tons of fruit and vegetables were destroyed.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 25TH, 1926.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 302 (last week 315); scarlet fever, 1314; diphtheria, 1056; enteric fever, 30; pneumonia, 1173; puerperal fever, 39; puerperal pyrexia, 104; cerebro-spinal fever, 7; acute poliomyelitis, 23; acute polio-encephalitis, 6; encephalitis lethargica, 29; dysentery, 14; ophthalmia neonatorum, 100. There was no case of cholera, plague or typhus fever notified during the week.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (0) from enteric fever, 14 (0) from measles, 9 (0) from scarlet fever, 39 (16) from whooping-cough, 36 (9) from diphtheria, 36 (6) from diarrhœa and enteritis under 2 years, and 69 (16) from influenza. The figures in parentheses are those for London itself, in which, it will be noted, there has again been no death during the week from measles, scarlet fever, or enteric fever.

VOLUNTARY HOSPITALS AND POOR-LAW INFIRMARIES. Mr. Reginald E. Watson, acting chairman of the West London Hospital, has suggested that there should be a conference between the chairmen of the London voluntary hospitals and "those responsible for the future health services of the County of London" to discuss "whether rivalry or coöperation is to be the ruling policy."

MANCHESTER CORONER'S ANNUAL REPORT.—The city coroner, Mr. C. W. W. Surridge, states in his annual report that during 1926 the number of cases referred to the coroner totalled 1130. Inquests held numbered 633, a decrease of 40 compared with 1925. The chief cases were deaths due to motor vehicles, 87—an increase of 36 on the previous year: tram-cars, 4; scalds, 121; burns, 18; manslaughter and murder, 5; and alcoholism, 10.

Correspondence.

"Audi alteram partem."

TREATMENT OF TUBERCULOSIS BY MR. SPAHLINGER'S METHODS.

To the Editor of THE LANCET.

SIR,—In his article which appeared in your issue of Jan. 1st, Dr. Thomas Nelson records the history of ten cases treated by the Spahlinger methods at St. George's Hospital in 1913–14. It would be interesting to know why he did not include the eleventh case. While admitting into the category of those which he appears to regard as relevant to the issue, two cases one of which received three injections and the other six, he makes no mention of one which may legitimately be described as one of Spahlinger's most striking successes. This was that of a man Edward Thomas Allen, now aged 44, whom I had treated at the French Hospital by the Spahlinger methods for some weeks, and whom I handed over to my friend Arthur Latham at St. George's because the lay authorities at the French Hospital objected to his continued presence there, on the ground that he did not comply with the French-speaking qualification. I have to-day seen and spoken with this man, who is now, and for the last eight years has been, a luggage porter at Claridge's Hotel. He reminded me that when I first saw him his weight had fallen from his normal of 13 st. 4 lb. to 8 st. 1 lb.: that he was treated at St. George's by the Spahlinger remedies for several weeks, receiving an injection on the average of one every two days. At the end of that time his improvement was such that he was discharged. The improvement has been fully maintained. He has completely regained his weight, and is engaged in very active physical work.

That this case fails to appear in Dr. Nelson's account is susceptible of but two explanations. The one is that it was deliberately suppressed by Dr. Nelson, which I decline to believe; the other, that the records of the Spahlinger cases at St. George's are so defective as to render them completely valueless for any statistical purpose.—Your obedient servant,

LEONARD WILLIAMS.

Harley House, N.W. 1, Jan. 3rd, 1927.

THE ABANDONED MENTAL DEFICIENCY BILL.

To the Editor of THE LANCET.

SIR,—In view of the misunderstanding which appears to prevail in certain quarters regarding the now abandoned Mental Deficiency Bill, perhaps you will be good enough to allow me to attempt to explain the purpose and scope of this measure.

It is apparently thought by some persons that the Mental Deficiency Act of 1913, if not actually designed to obtain control of individuals who are quite capable of looking after themselves, has at all events been used for such a purpose, and that consequently any amendment which would facilitate its working should be strenuously resisted. There could be no more mistaken view. The Act of 1913 was a long overdue measure passed in the interests not only of the community but also of defectives themselves, and it has not inaptly been termed "The Charter of the Feeble-minded." Speaking from a large experience of the working of this Act, I have never known, or heard of, a single instance in which a person has been dealt with under it who was not in need of supervision. It should also be pointed out that, contrary to what is often thought, certification under the Act is by no means irrevocable. Every first order automatically expires at the end of a year and each case must then be reviewed and, if considered necessary, another order signed. A further review takes place at the expiration of another year and subsequently at five-yearly periods.

As a matter of fact, far from being applied improperly or too widely, circumstances have combined to interfere very seriously with the working of the Act, and to withhold from thousands of defectives the protection of which they are in need. As evidence of this I may state that while the total number of defectives in the country is estimated at approximately 174,000, about half of whom are in *urgent* need of care, the total number dealt with under the Act of Jan. 1st, 1926, was only 36,815, of whom 15,733 were under supervision in their own homes.

There are two main reasons for this. One is the utter inadequacy of existing accommodation; the other is the wording of the definitions of the Act. According to the Act of 1913, the mental defect must have existed "from birth or from an early age." Personally, I have always contended, and taught, that the chief purpose of these words was to differentiate between arrested mental development and disorder or decay arising *after* the mind had attained to that degree of development which would enable the individual to transact the ordinary affairs of life, and that the words should be interpreted in this sense. But many magistrates, and some medical men, have placed a much narrower construction upon them; they have taken "an early age" to mean the first few years of life, and it is this which has led to considerable difficulty in the administration of the Act.

For instance, there are individuals in whom the defect, although undoubtedly of such a nature as to render them in need of care, supervision, and control, has not made itself evident until the years of adolescence. The increased demands of life, even of a simple one, have then rendered patent a deficiency which had hitherto been latent. There are other cases in which an arrest of mental development has actually been caused during early adolescence, as, for example, by encephalitis lethargica. There are yet others where no early history is obtainable. It is obvious that cases of this kind, and they are numerous, will be excluded from the protection of the Act by a narrow interpretation of the words "from an early age," and a recent Home Office Committee were so much impressed by this that they recommended that these words should be entirely deleted. In my opinion, however, such deletion, in the absence of any definition of mental defect, would have brought within the scope of the Act persons who were not really mentally defective and to whom it was not meant to apply, and I think the Minister of Health was wise in introducing a clause which, whilst doing away with the difficulty resulting from the original definition, yet made it clear that mental defectiveness was not disorder or decay of mind, but "arrested or incomplete" mental development.

The question has been raised as to the applicability of the new definition to adults. I am very definitely of the opinion that, with the exception of adults in whom the defect has been brought about before the termination of adolescence, the new definition would no more apply to adults than did the old one. Since mind reaches a stage of development which may be regarded as normal or adequate for the ordinary purposes of life before the termination of adolescence, it is clear that any change taking place *after* this is not mental arrest. Personally, I should certainly object to any definition which extended the scope of the Act to cases of mental disorder or decay, which are already provided for by the Lunacy Act; but I am convinced that it is not intended to do this and that the Bill does not, in fact, do so.

It is important to point out that the definition of mental defectiveness in the Bill must be read in conjunction with the definitions contained in the preceding clause. For a person to come within the scope of the Act the arrested or incomplete development of mind must be of such a degree as to prevent him from "guarding himself against common physical dangers"; or from "managing himself or his affairs"; or be so pronounced as to necessitate "care, supervision, and control" for his own protection or for the protection of others.

In conclusion, there can be no doubt that the Mental Deficiency Act of 1913 is not only a sound measure of social reform, but that it is in the highest degree a humane measure. I find it simply amazing that any person who has read the Report of the Royal Commission of 1904, or who has any practical knowledge of mental defectives, or who is even really concerned for the welfare of the community, should obstruct a Bill, the sole purpose of which is the remedying of defects which experience has revealed in the original Act. I am convinced from the comments and letters which have reached me that workers who have spent years in endeavouring to improve the lot of the unfortunate mental defectives will view the abandonment of the Bill with dismay.

I am, Sir, yours faithfully,

A. F. TREDGOLD, M.D.

New Cavendish-street, W., Jan. 4th, 1927.

OSTEOGENESIS IMPERFECTA.

To the Editor of THE LANCET.

SIR,—I have read with interest the case recorded by Dr. Donald Hunter in your issue of Jan. 1st. There is at present in the Wakefield Hospital a somewhat similar case. A. J., aged 13, has blue sclerotics. His head is large and his eyes are prominent. His father and two brothers have also blue sclerotics, but appear otherwise quite normal. The first fracture occurred when he was about a year old, and altogether about 23 fractures affecting the lower extremities only. A few months ago he was admitted with fractures of both femora and both tibiæ. This time his left femur and right tibia were fractured and the right femur snapped after admission without any very obvious cause. Pain was severe but of short duration. Fractures have been simple, except on one occasion when he had a severe compound fracture of the right leg. Union has always occurred within the ordinary period. The Wassermann reaction is negative.

I am, Sir, yours faithfully,

Wakefield, Jan. 3rd, 1927. J. W. THOMSON.

ADOLESCENT ALBUMINURIA.

To the Editor of THE LANCET.

SIR,—In reply to Dr. Geoffrey Evans's very interesting letter I rather gather, perhaps mistakenly, that he is inclined to believe that the presence of albumin in an after-rest specimen definitely lifts the case out of the class of adolescent albuminuria. This is undoubtedly true, of course, in a number of instances, but not, I think, in a good many others; and it is rather the *consistent* appearance of albumin in after-rest specimens that should be regarded, as I suggested in my original article, from a more stringent point of view. Thus I find in the last 26 cases before me in which the after-rest specimen contained albumin in otherwise healthy-seeming boys and men, in 16 of them it had disappeared from a subsequent after-rest specimen. And I think there is very little doubt that these were all cases of ordinary adolescent albuminuria. Even when the after-rest specimen consistently contains albumin it is sometimes difficult, and one would welcome any light on the problem to differentiate it in the absence of any other signs or symptoms from ordinary adolescent albuminuria. Thus I have before me the case of a boy of 16 in whom albumin was first found in October, 1925, the after-rest specimen being then free. Examined again, however, on March 4th, March 17th, March 31st, May 14th, and August 12th, 1926, every after-rest specimen as well as every after-exercise specimen contained albumin, the boy's general health being apparently excellent and his blood-urea, urine-urea concentration test, and microscopical examination being all normal. Had he throughout all these months been suffering from some toxæmic condition or definite damage to renal tissue, it is hard to believe that he would not have exhibited some other manifestations of ill-health. And this case, too, I am inclined to think, is really one of harmless adolescent albuminuria. The fact remains, however, that in the very great majority of cases the after-rest specimen is free from albumin.—I am, Sir, yours faithfully,

H. H. BASHFORD.

Jan. 1st, 1927. Medical Department, General Post Office.

DIFFUSE GASTRIC POLYPOSIS.

To the Editor of THE LANCET.

SIR,—In your recent annotation on a paper by Brunn and Pearl on Diffuse Gastric Polyposis [1] no reference is made to the only case of the kind recorded in England. In the *Guy's Hospital Reports* for July, 1926, I described a typical case in which complete gastrectomy was successfully performed by Mr. Lancelot Bromley. A man aged 36, had suffered from anæmia since 1917, together with diarrhœa, nausea, and occasional attacks of vomiting. On admission he was found to have complete achlorhydria and constant occult blood in his stools, and the X rays showed a well-marked deformity on the greater curvature of his stomach. Evacuation occurred with extreme rapidity. The hæmoglobin percentage, which had been 65 in May, 1925, was now only 44.

A portion of the excised stomach photographed after fixation. Reduced one-half. (Taken from the Guy's Hospital Reports.)

As it seemed very probable that a growth was present in spite of the long history, Mr. Bromley operated on April 18th, 1926. He found that the wall of the stomach was very thick, with the vessels on the outside much injected; it did not, however, feel like a growth. As the condition was clearly very abnormal, and was probably the cause of the anæmia, it was decided to perform a complete gastrectomy. The patient recovered satisfactorily, and when seen ten months later he was looking very well and felt better than he had done since 1917. His hæmoglobin percentage was 85, and no occult blood was present in the stools.

Prof. Adrian Stokes reported that the mucous membrane of the excised stomach was greatly thickened and covered with closely packed polypi (a portion of a half scale photograph is here reproduced), which had failed to develop stalks on account of their close proximity to each other. Numerous superficial hæmorrhages were present. Microscopical examination showed that the condition was one of extreme hypertrophic gastritis. There was hyperplasia and hypertrophy of all the coats, most evident in the mucous coat at the cardiac end; there was clear evidence of subacute and chronic inflammatory changes in the mucosa; there was no evidence of tumour formation and no metaplasia of the epithelium.

I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, Dec. 27th, 1926.

[1] THE LANCET, 1926, ii., 1280.

TUBERCULOSIS OF THE KIDNEY.

To the Editor of THE LANCET.

SIR,—I read with great interest the leading article on renal tuberculosis in your issue of Dec. 25th, 1926. Whilst endorsing completely all that is said about the value of early nephrectomy in cases of unilateral infection, I do not agree with those referred to in the last paragraph, who believe that tuberculin "is useless in the management of tuberculous kidney." For several years I have always had my bilateral cases of renal tuberculosis treated by systematic injections of tuberculin in accordance with the usual practice at All Saints' Hospital. I do not make extravagant claims for the treatment, as unfortunately there are many cases which do not respond to it, but a large number are materially benefited, as is seen by the increase in weight, the improvement in health, and a general amelioration of the distressing symptoms. Several appear cured, and are living their ordinary lives free from symptoms. All such, however, are warned to avoid exposure and fatigue and cannot, therefore, be regarded as strictly normal.

I am, Sir, yours faithfully,

H. L. ATTWATER, M.Ch., F.R.C.S.

Wimpole-street, W., Dec. 28th, 1926.

IRRADIATION AND CELL DIVISION.

To the Editor of THE LANCET.

SIR,—A leading article in your issue of Oct. 9th, 1926, referred to recent work by the late Dr. T. S. P. Strangeways and others on irradiation and cell division, in which it was shown that cells in certain stages of growth were apparently more easily influenced by radiation than cells which were undergoing mitosis. This article drew a reply from Dr. J. C. Mottram, one of the participants in the researches, to the effect that previous work by P. Hertwig and by himself had shown the ova of ascaris when undergoing mitosis to be particularly susceptible to radiation. I have rather gathered, since Dr. Mottram's letter was published, that the inference most people would draw would be that the two positions were mutually irreconcilable, and my object in writing, even so late in the day, is to suggest that this is not so.

It would be unfortunate at this stage in the radiological investigations which are being actively pursued at three research laboratories—viz., the Research Hospital, Cambridge, the Radium Institute, London, and the Middlesex Hospital—if their results should even appear to be at variance. Such, however, is not the case, and if any misconception has arisen in the matter it is, I think, to a large extent due to the use of terms not always strictly in the same sense. The word mitosis occurs to me in this connexion. Two sets of experiments lead to the following conclusions: (1) cells (ova of ascaris) in mitosis are more vulnerable to radiation than when in the resting stage; (2) cells (animal tumour cells) in a state of division suffer no immediate recognisable changes on exposure to large doses of beta radiation, though such doses prevent cells going into mitosis. These conclusions may appear difficult to reconcile one with the other, but the difficulty arises partly, I think, from the use of the word mitosis to describe processes which presented themselves very differently to the people who did the experiments. Strangeways's observation that the cells going through the process of division continue to do so when given doses of X rays large enough to stop cells entering mitosis does not necessarily contradict the observation that cells in mitosis are more easily killed than when these cells are in a resting condition.

This letter was written before the news reached me of the death of Dr. Strangeways—a terrible loss to radiology. A few weeks ago we were discussing the effects of radiation on living tissues, and he said to me, "One is just beginning to see daylight."

I am, Sir, yours faithfully,

SIDNEY RUSS.

Cancer Research Laboratories, Middlesex Hospital, W., Dec. 31st, 1926.

ULTRA-VIOLET RADIATION.

To the Editor of THE LANCET.

SIR,—Dr. Weinbren asks for greater detail of the technique adopted for the cases reported by us in your issue of Dec. 11th, 1926. Over 200 exposures were made on these seven cases, and the space precluded us from entering into minutiæ as to the reasons for the varying types of lamps used and the varying length of individual exposure. The reason why one type of lamp alone was not used throughout is that in our experience better results are obtained in general exposures by using both carbon and mercury vapour—the carbon, as is well known, being richer in the near ultra-violet rays and more penetrating than the mercury vapour, which gives a larger proportion of the far ultra-violet spectrum. For local treatment the tungsten arc seems to give better results in irradiating cicatrised areas of any size, whereas the Kromayer, with its quartz applicators of various shapes and sizes, is more useful for smaller areas such as pustules and fistulæ.

If Dr. Weinbren will again read through our conclusions on Case 3, Hodgkin's disease, he will find that the bogy he has raised is of his own making. This case was sent us by a consultant for treatment of the associated secondary anæmia, and our only comment was: "The results in this case would suggest that the artificial, no less than the natural, sunlight has a therapeutic value in alleviating the symptoms and retarding the progress of Hodgkin's disease." A long way, surely, from claiming, as Dr. Weinbren states we do, that ultra-violet light is a cure, and the only one, for this condition. Dr. Weinbren then gives his experience of ultra-violet light in two cases of Hodgkin's disease. If we understand him correctly, the first patient was suffering from pulmonary tuberculosis, with tubercle bacilli in the sputum, as well as from Hodgkin's disease. It is commonly accepted that active pulmonary tuberculosis is a contra-indication to ultra-violet treatment. The second case received ultra-violet radiation for one month, stated that he felt better, and there was a decrease in the size of his spleen. He then discharged himself from treatment, and after several months returned to hospital in a hopeless condition. From this case we should feel diffident in drawing any conclusion.

We agree with Dr. Weinbren that the value of ultra-violet radiation in Hodgkin's disease remains to be proved.

We are, Sir, yours faithfully,

A. LISLE PUNCH.

London, W. 1, Dec. 28th, 1926. RUSSELL WILKINSON.

LIPOID NEPHROSIS.

To the Editor of THE LANCET.

SIR,—In their very interesting study on the above subject in your issue of Jan. 1st Drs. Bennett, Davies, and Dodds commence their summary as follows: "Apart from albuminuria it is difficult to demonstrate any clinical evidence of renal disorder in the dropsical type of 'nephritis.'" Surely the obvious retention of water in these cases must be accepted as evidence of renal disorder, whatever theory may be put forward to explain the occurrence of this retention, when there is no decided complicating cardiac insufficiency. Probably the œdema connected with the retention of water, if it comes to involve the central nervous system, plays a chief part in producing one of the gravest complications—namely, so-called "uræmic" convulsions or "uræmic" eclampsia. If what was formerly termed "parenchymatous nephritis" is now to be spoken of as "nephrosis," then, obviously, the convulsive attacks (now, owing to improved treatment, less commonly complicating the chronic dropsical cases than they formerly did) ought to be called "nephrotic" convulsions, unless the other foreign term, "pseudo-uræmic" convulsions, be preferred. The theoretical explanation of such "nephrotic" convulsions has an important thera-

peutic aspect, notably in regard to the limitation of the intake of water.

If the authors are correct in regard to the hypercholesterolæmia, the passage which they quote from my paper (or rather from my quotation) ought to be altered to "the frequency of hypercholesterolæmia in *pseudo-uræmic* [instead of uræmic] and chronic *nephrotic* [instead of nephritic] cases."

I am, Sir, yours faithfully,

London, W. 1, Jan. 1st, 1927. F. PARKES WEBER.

SYPHILIS AND MALIGNANT DISEASE.

To the Editor of THE LANCET.

SIR,—I should like to learn of the record of a case of undoubted malignant disease associated with acute generalised syphilis and the effect of the latter upon the former. I do not refer to malignant disease following tertiary syphilis or arising upon a syphilitic scar. These cases are common and probably due to chronic irritation by an attenuated virus. Acute syphilis is destructive to embryonic tissue—e.g., the fertilised ovum—hence this query.

I am, Sir, yours faithfully,

London, W., Jan. 1st, 1927. M. W. BROWDY.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

E. C. Downer and R. H. Dummett to be Surg. Lts.

ROYAL NAVAL VOLUNTEER RESERVE.

Prob. Surg. Lt. J. A. Kerr is confirmed in rank.

ROYAL ARMY MEDICAL CORPS.

Capts. to be Majs.: H. C. Godding, T. J. L. Thompson, and W. E. K. Coles (Prov.).

ARMY DENTAL CORPS.

Maj. J. G. Worsley retires, receiving a gratuity.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. R. S. Morshead, from the Active List, to be Capt.

ROYAL AIR FORCE.

Squadron Leader H. B. Porteous to be Wing Commander.

INDIAN MEDICAL SERVICE.

The King has approved the appointment of Major-General F. H. G. Hutchinson, C.I.E., as Honorary Surgeon to the King, in succession to Major-General Sir Robert C. Macwatt, C.I.E., who has retired.

The King has approved the regrading of the following officers:—Capts.: R. W. H. Miller and C. J. Smith; Lts.: T. J. Davidson, E. G. Michelson, D. MacD. Fraser, and S. C. H. Worseldine.

Nasiruddin Ahmed to be Temp. Lt.

The King has approved the retirement of Maj. H. R. B. Gibson.

Maj. W. R. Stewart has assumed the appointment of Second-in-Command, Indian Military Hospital, Karachi, vice Capt. S. D. Sondhi, relieved; and Lt.-Col. D. C. V. Fitzgerald has assumed command of the Indian Military Hospital, Karachi, vice Maj. C. Newton Davis, relieved. Lt.-Col. R. F. Baird, officiating Inspector-General of Civil Hospitals, United Provinces, on relief, to Allahabad as Civil Surgeon. Lt.-Col. C. A Sprawson, professor of medicine, King George's Medical College, Lucknow, and Dr. Saiyid Ghulam Murtaza, lecturer in medicine, Agra Medical School, have been appointed Members of the Governing Body of the United Provinces State Medical Faculty. Maj. E. A. Perry, military medical officer, Roorkee, to be the civil medical officer of Roorkee, in addition to his own duties, vice Capt. G. A. Hildreth; and Maj.-Gen. W. H. Ogilvie, to be officiating Director of Medical Services in India, vice Maj.-Gen. O. L. Robinson, granted privilege leave ex-India.

GUY'S HOSPITAL.—It is stated that Sir Gilbert Wills, who is a governor of the hospital, has promised to give £50,000 to the bicentenary fund in order that the out-patients' and casualty department may be extended and their equipment brought up to date.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates satisfied the examiners in the undermentioned subjects:—

Surgery.—F. W. Barton, Middlesex Hosp.; G. Danby, Manchester; J. H. Gillatt, Sheffield; T. W. Riseley, Cardiff; K. Roberts, Liverpool; N. S. J. Roberts (Sect. I.), Bristol and Royal Free Hosp.; and J. B. Scarr and S. Wray, Manchester.

Medicine.—A. C. F. Barrow, Edinburgh; G. Danby, Manchester; H. J. Fordham, St. Mary's Hosp.; and W. E. Ivers and C. H. Spencer, Manchester.

Forensic Medicine.—L. Ashkenza, Middlesex Hosp.; R. Bobo, Paris; G. Danby, Manchester; S. K. Rigg, Bristol; L. W. Rose, Guy's Hosp.; and T. de L. Walker, King's College Hosp.

Midwifery.—F. G. Hardaker, St. Mary's Hosp.; T. C. Lansdale, Guy's Hosp.; and L. Wasef, Manchester.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: F. W. Barton, H. J. Fordham, W. E. Ivers, T. W. Riseley, J. B. Scarr, and C. H. Spencer.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on Dec. 15th the Vice-Chancellor stated that an offer of £10,000 towards the establishment of a Chair of Dietetics had been received from a lady who desired to remain anonymous.—It was announced that the William Julius Mickle Fellowship for 1927 had been awarded to Mr. Percival Hartley, D.Sc., in respect of his work on special problems in connexion with diphtheria and general serology and immunity. The Fellowship this year is of the value of about £280.—An offer by Lady Godlee of a sum of money (to be held in trust for University College and University College Hospital Medical School) to found a Rickman Godlee Lectureship in memory of her husband, the late Sir Rickman J. Godlee, Bart., was accepted; and it was resolved to convey the thanks of the Senate to Lady Godlee for her gift.

University College.—A course of three lectures on the Action of the Sense Organs is to be given by Dr. E. D. Adrian, F.R.S., on Feb. 9th, 16th, and 23rd, at 5 P.M.; also a course of three lectures on Biological Action of Light will be given by Dr. D. T. Harris on Jan. 20th and 27th and Feb. 3rd at 5 P.M.; and a course of six lectures on Cytology in Relation to Physiological Processes will also be given by Dr. R. J. Ludford on Jan. 20th, 27th, and Feb. 3rd, 10th, 17th and 24th at 5.30 P.M.

Middlesex Hospital Medical School.—A course of four lectures on Current Views on Internal Secretion will be given by Prof. Swale Vincent on Jan. 14th, 18th, 21st and 25th at 4 P.M.

Admission to all these courses is free, without ticket.

St. Thomas's Hospital.—A course of three lectures on a subject connected with pharmacology is to be given during February by Prof. W. Storm van Leeuwen, of the University of Leiden.

ROYAL SANITARY INSTITUTE.—A sessional meeting will be held on Friday, Jan. 28th, at 7.30 P.M., in the small Town Hall, Reading, when a discussion on Cancer will be opened by Sir Stewart Abram, who will speak from the point of view of the physician and the public authority. Dr. T. Skene Keith will speak on Cancer Research To-day, and Mr. J. L. Joyce on The Present Position of the Treatment of Cancer. Prof. H. R. Kenwood will preside. On the following day visits will be paid to places in the neighbourhood. Those proposing to attend the discussions, luncheon and excursions should notify Dr. H. J. Milligan, Old College Buildings, St. Laurence's Churchyard, Reading, not later than Jan. 22nd.

PEOPLE'S LEAGUE OF HEALTH.—The Sims Woodhead series of ten constructive educational health lectures will be given in the lecture room of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., beginning on Monday, Jan. 31st, at 6 P.M., and continuing on the following Mondays at the same hour. Among those who have promised to lecture are Prof. H. E. Roaf, Mr. E. B. Turner, Mr. Vincent Denne, Dr. H. Gardiner-Hill, Prof. B. Collingwood, Sir Robert Armstrong-Jones, Dr. H. Crichton-Miller, Dr. L. Shore, and Prof. M. S. Pembrey, F.R.S. Tickets and further information may be had from Miss Olga Nethersole, The People's League of Health, 12, Stratford-place, London, W. 1.

PHARMACEUTICAL SOCIETY.—An evening meeting of the Pharmaceutical Society of Great Britain will be held at the Society's house on Tuesday, Jan. 11th, at 8 P.M., when Mr. J. H. Franklin will read a paper entitled Notes on Preparations of the British Pharmacopœia, 1914. A discussion will follow. Medical friends of members and student-associates will be cordially welcomed.

MIDDLESEX HOSPITAL.—Dr. A. F. Voelcker will deliver an Emeritus Lecture in the large lecture theatre of the Medical School on Friday, Jan. 14th, at 3 P.M. The subject will be the Unscarred Abdomen.

ROYAL SOCIETY OF ARTS.—A paper on the Forecasting and Control of Cholera Epidemics in India will be read before the Indian Section of the Royal Society of Arts by Sir Leonard Rogers, F.R.S., on Friday, Jan. 28th, at 4.30 P.M. The chair will be taken by Sir Michael O'Dwyer, formerly Lieutenant-Governor of the Punjab. Tickets may be had from the Secretary, Indian Section, Royal Society of Arts, John-street, Adelphi, London, W.C. 2.

RONTGEN SOCIETY.—A general meeting will be held in the British Institute of Radiology, 32, Welbeck-street, London, W., on Tuesday, Jan. 11th, at 8.15 P.M., when a paper on Some Experiments on the Production of Rapid Serial Skiagrams from the Screen Image by means of a Cinematograph Camera will be read by Dr. Russell J. Reynolds. At 8.30 P.M. there will be a special general meeting to consider the proposed amalgamation with the British Institute of Radiology.

BRITISH INSTITUTE OF PHILOSOPHICAL STUDIES.—A course of ten lectures on the Philosophy of Social Life will be given by Mr. C. Delisle Burns, D.Lit., at the University of London Club, 21, Gower-street, W.C., on Tuesdays, at 6 P.M., beginning on Jan. 11th.—A course of ten lectures on the World of Values will be given by Prof. John S. Mackenzie, at the Royal Anthropological Institute, 52, Upper Bedford-place, London, W.C., on Thursdays, at 5.30 P.M., beginning on Jan. 13th. Full particulars of these courses may be had from the Director of Studies, 88, Kingsway, London, W.C. 2.

LECTURES ON THE CARE OF INFANTS.—Under the auspices of the National Association for the Prevention of Infant Mortality and for the Welfare of Infancy a course of post-graduate lectures for health visitors, nurses, midwives, and others interested, will be given at the Infants Hospital, Vincent-square, Westminster, on Mondays from 6.30 to 7.30 P.M., from Jan. 3rd to March 7th. The lecturers include Dr. J. S. Fairbairn, Dr. Muriel Radford, Dr. Eric Pritchard, Dr. Donald Paterson, Dr. W. E. Robinson, Mr. Vincent Denne, Dr. H. C. Cameron, and Mr. A. H. Todd. A course of advanced lectures on the same subject, for creche nurses and probationers, will be given by Dr. Victoria Bennett, at Carnegie House, 117, Piccadilly, London, W., on Thursdays, from 7.30 to 8.30 P.M., from Jan. 27th to March 31st. Particulars of both courses may be had from the Secretary of the Association, at Carnegie House.

MEDICO-LEGAL SOCIETY.—This Society has accepted the invitation of the Obstetrical Section of the Royal Society of Medicine to hold a joint meeting at 8 P.M. on Friday, Jan. 21st, at the Hall of the Royal Society of Medicine, 1, Wimpole-street, London, W. 1. The subject for debate will be the Ethical, Legal, and Medical Aspects of Abortion, and the speakers will include Dr. J. S. Fairbairn, Lord Riddell, Dr. T. W. Eden, and Sir Travers Humphreys. Lord Justice Atkin, the President of the Medico-Legal Society, has consented to take the chair and to sum up the debate at its conclusion. Members of the Medico-Legal Society desirous of taking part in the discussion are asked to send in their names to either of the hon. secretaries not later than Jan. 17th.—An ordinary meeting of the society will be held at 11, Chandos-street, Cavendish-square, London, W. 1, on Thursday, Jan. 27th, at 8.30 P.M., when a paper will be read by Dr. Halliday Sutherland on a Case Concerning Survival in an Aeroplane Crash. A discussion will follow. Members may introduce guests on production of a member's private card.

WELSH NATIONAL MEDICAL SCHOOL.—A special meeting of the Court of the University of Wales will be held on Jan. 14th to consider the future status and government of this school. A draft charter has been prepared by the University Council which provides for its establishment as an independent school in the university, as recommended by a Royal Commission in 1916. At a previous meeting as long ago as October, 1925 (see THE LANCET, 1925, ii., 925), the Court agreed in principle to this scheme, which has, however, been vigorously opposed by the Council of the University College of South Wales and Monmouthshire, to which the Welsh National Medical School has hitherto been attached. The chief point of difference appears now to concern the departments of anatomy and physiology. The University Council recommend their inclusion in the School of Medicine, but are willing to consider submitting the matter to a committee of experts, but the University College of South Wales and Monmouthshire are not prepared to agree to this and have prepared an alternative draft charter providing for their exclusion. The University Court, which meets next Friday at Shrewsbury, will decide on Jan. 14th which of these draft charters is to be submitted to the Privy Council for consideration.

DUBLIN (83) GENERAL HOSPITAL UNIT.—The annual dinner of the Dublin (83) General Hospital Unit was held on Jan. 1st in the Royal College of Surgeons, under the presidency of Colonel Sir William Taylor, organiser of the unit. Of the original 30 members, 25 survive, and of these 17 were this year able to attend the dinner. The only guests were Colonel A. Fullerton, President of the Royal College of Surgeons in Ireland, who was consulting surgeon to the army in the area in which the unit served in France in 1917–18, and Mr. A. Miller, Registrar of the College. The chairman spoke with regret of the death of one member, Lieut.-Colonel G. Jameson Johnston, since the last annual dinner, and of one who had been a guest at several dinners, General R. H. Sawyer, who had been the deputy director of medical services under whom the unit served.

PRIZES FOR INFORMATION ABOUT CANCER.—Mr. William Lawrence Saunders, of New York, has offered a prize of $50,000 "to any person or group of persons who may discover what human cancer is and how it can positively be prevented," and a similar sum "to any person or group of persons who may discover an absolute cure for human cancer." The offer is to stand open for three years and may then be renewed. Mr. Saunders thinks that "through the lure of a reward this serious problem might be solved through the genius of a lay mind, by chemists, or through unknown and unorganised medical sources." The decision upon which the awards will be made is to be reached by the American Society for the Control of Cancer and approved by the American Medical Association and the American College of Surgeons.

THE LATE DR. ALFRED SCOTT.—At the age of 71 Dr. Alfred Scott died at Crowborough on Dec. 22nd. Born at Brighton, he was the fourth son of the late Dr. S. L. Scott, who practised in the town, and was educated at Bradfield College. He studied medicine at Guy's Hospital and became M.R.C.S. Eng. in 1879 and L.R.C.P. Lond. in 1882. A few years later he settled at Brighton and held a number of appointments in the neighbourhood besides having an extensive private practice. He was medical attendant at Brighton College during the whole of his practising life, which lasted nearly 40 years. He went to live at Crowborough on his retirement four years ago. Dr. Scott leaves a widow and four children of whom two, Dr. Evelyn Scott and Dr. P. D. Scott, are members of the medical profession.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY, Burlington House, Piccadilly, W.

THURSDAY, Jan. 13th.—4.30 P.M. *The following papers will be read:* F. W. R. Brambell, A. S. Parkes, and Una Fielding: Changes in the Ovary of the Mouse following Exposure to X Rays. Parts I. and II. (Communicated by Prof. J. P. Hill.) A. S. Parkes: On the Occurrence of the Œstrous Cycle after X Ray Sterilisation. Part II. Irradiation at and before Birth. (Communicated by Prof. J. P. Hill.) R. M. Sargent: Recovery from Vigorous Exercise of Short Duration. (Communicated by Prof. A. V. Hill.) F. A. Pickworth: Basal Metabolism as Determined by the Respiratory Exchange. (Communicated by Dr. J. S. Haldane.) M. Dixon: On the Mechanism of Oxidation-Reduction Potential. (Communicated by Sir Frederick Hopkins.) R. G. Canti and M. Donaldson: The Effect of Radium on Mitosis in vitro. (Communicated by Sir Frederick Andrewes.) R. J. Ludford and W. Cramer: Secretion and the Golgi Apparatus of Islets of Langerhans. (Communicated by Dr. J. A. Murray.) S. Dickinson: Experiments on the Physiology and Genetics of the Smut Fungi. Hyphal Fusion. (Communicated by Sir John Russell.) Y. Azuma: Effects of C- and K-Ions and Ultra-Violet Rays upon Involuntary Muscles. Effects of Ultra-Violet Rays upon Skeletal Muscles. (Communicated by Dr. L. Hill.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Jan. 11th.—4 P.M., PSYCHIATRY. Clinical Meeting at the Maudsley Hospital, Denmark Hill, S.E. 5. Tea will be provided by the kindness of the Medical Superintendent, Dr. E. Mapother.

WEDNESDAY.—5.30 P.M., SURGERY: SUBSECTION OF PROCTOLOGY. (Cases at 5 P.M.) Extra Meeting for a series of short papers limited to ten minutes each. *Papers:* Dr. E. Ulysses Williams and Mr. Lionel E. C. Norbury: Normal Variability of the Action of Pituitrin on the Contractile Power of the Cæcum and Colon. Mr. Lionel E. C. Norbury and Mr. C. N. Morgan: The Value of Lipiodol in Determining the Extent of Fistulæ-in-Ano. Mr. Rodney Maingot: Gummatous Colitis (with report of a case). Dr. Cuthbert Dukes: Laboratory Tests for the Diagnosis of Cancer of the Rectum and Colon. Mr. W. B. Gabriel: (1) Volvulus of the Pelvic Colon and Blind Cæcostomy; (2) Skin Grafts for Fistulæ.

THURSDAY.—8.30 P.M., NEUROLOGY. Discussion on Epilepsy, to be opened by Dr. Aldren Turner.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 5 P.M.) Cases: Dr. Sibyl Eastwood: (1) Muscular Atrophy. Dr. Saxby Willis: (2) Case of Radicular Paresis of the Right Hand associated with Abnormal Bone Formation of the Seventh Cervical Vertebra and Sprengel's Shoulder. Dr. Saxby Willis and Mr. W. H. Ogilvie: (3) Case of Acromegaly of Traumatic Origin with Loose Bodies round an Enlarged Interphalangeal Joint. Dr. Bernard Myers: (4) Case of Essential Thrombocytopenic Purpura Hæmorrhagica one year after Splenectomy. Dr. Milligan: (5) Lymphatic Leukæmia with Ulceration of Tongue. Mr. Patey: (6) Case for Diagnosis of Abdominal Condition. Dr. Parsons-Smith: (7) Case of Heart Block. Dr. Parkes Weber: (8) Aleukæmic Lymphadenosis. 8.30 P.M., OPHTHALMOLOGY. (Cases at 8 P.M.) Cases: Dr. J. W. Tudor-Thomas: Foreign Body—Steel in Vitreous. Other cases will be shown. Paper: Dr. H. Moreland McCrea: Retinal Petechiasis a Clinical Entity of Auto-Intoxication.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Jan. 10th.—8.30 P.M., Presidential Address on Changes in the Clinical Aspects of Disease by Sir Humphry Rolleston, Bart., to be followed by a discussion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Jan. 10th, to SATURDAY, Jan. 15th.—COMBINED COURSE IN DISEASES OF CHILDREN at the Children's Clinic and the Royal Free Hospital. Afternoons and some mornings.—PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. Intensive course in medicine, surgery, and the specialties. Daily, 10.30 A.M. to 5.30 P.M., Clinical and laboratory methods, demonstrations, operations, &c. Formal lectures at 4.30 P.M. open to members of the Fellowship of Medicine.—ROYAL NORTHERN HOSPITAL, Holloway-road, N. Jan. 11th, 3.15 P.M., Dr. Punch: The Modern Treatment of Pulmonary Tuberculosis. Lecture free to members of the medical profession.—BETHLEM ROYAL HOSPITAL, S.E. Tues. and Sat., 11 A.M., Lecture-demonstrations on Diagnosis and Symptomatology of Mental Diseases and Psycho-Neurosis. Further information from the Secretary of the Fellowship of Medicine.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Jan. 10th.—10 A.M., Mr. MacDonald: Genito-Urinary Operations. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Donald Armour: Operations.

TUESDAY.—10 A.M., Medical Registrar: Clinical Methods. 12 noon, Dr. Burrell, Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—2 P.M., Mr. Tyrrell Gray: Operations. 2 P.M., Dr. Owen: Medical Out-patients. 4 P.M., Dr. Page: Methods of Anæsthesia in Special Cases.

THURSDAY.—12 noon, Mr. Simmonds: Demonstration of Fractures. 3 P.M., Sir Henry Simson: Gynæcological Wards. 4 P.M., Dr. Snowden: The Development of the Mind.

FRIDAY.—10.30 A.M., Dr. Dowling: Skin Dept. 11 A.M., Dr. Pritchard: Modern Methods in Medicine. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Dept.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 5 P.M., Operations, Medical, Surgical, and Special Out-patient Departments, Saturdays, 10 A.M. to 1 P.M.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

THURSDAY, Jan. 13th.—9 P.M., Dr. H. G. Adamson: The Erythemata.

POST-GRADUATE HOSTEL, Imperial Hotel, Russell-sq., W.C.

THURSDAY, Jan. 13th.—9 P.M., Mr. E. I. Spriggs: Diverticulitis.

FRIDAY.—9 P.M., Prof. D. P. D. Wilkie: Cholecystography. Dinner 8 P.M., 5s. Light refreshments 10 P.M.

UNIVERSITY COLLEGE, Gower-street, W.C.

FRIDAY, Jan. 14th.—5 P.M., Dr. P. Stocks: Vital Statistics.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL.

FRIDAY, Jan. 14th.—4 P.M., Dr. Dan McKenzie: The Surgical Anatomy of the Temporal Bone. With Epidiascope Demonstration.

ST. MARGARET'S HOSPITAL, POST-GRADUATE LECTURES, Acomb-street, Manchester.

WEDNESDAY, Jan. 12th.—4 P.M., Dr. Arthur Giles: Birth Control.

Appointments.

CUNNINGHAM, A. J. W., M.D. Camb., D.P.H., has been appointed Medical Officer for the Sefton Rural District.

LLOYD, ERIC I., M.B., B.Ch. Camb., F.R.C.S. Eng., Surgeon to the Hospital for Sick Children, Great Ormond-street.

Certifying Surgeons under the Factory and Workshop Acts: BADGER, C. W., M.B., Ch.B. Edin. (Penicuik, Co. of Edinburgh); COOK, J., M.B., Ch.B. Glasg. (Earl Shilton District, Leicester); NICHOLSON, G., M.D., F.R.C.S. Edin., D.P.H. (Tiverton); BRUNTON, W. D., M.B., Ch.B. Edin. (Richmond); BLAKEMORE, W. L., L.R.C.P. Lond., M.R.C.S. (Cannock, Stafford); JACKSON, L. N. (Crediton); and MCLEOD, N., M.B., Ch.B. St. And. (St. Andrews District, Fife).

Salford Royal Hospital: SOUTHAM, A. H., M.D., M.Ch. Oxf., F.R.C.S. Eng., and MCCREA, E. D'A., M.D., M.Ch. Dub., B.A.O., D.P.H., F.R.C.S. Eng. and Irel., Honorary Assistant Surgeons.

Vacancies.

For further information refer to the advertisement columns.

Adelaide University, South Australia.—Elder Professorship of Anatomy. £1100.

Ayr, Glengall Hospital for Mental Diseases.—Asst. P. £300.

Birmingham, Queen's Hospital Medical School.—Med. Reg. and Surg. Reg. Each £100.

Brighton, Royal Sussex County Hospital.—H.S. £150.

City of London Hospital for Diseases of Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Clinical Research Association, Ltd., Watergate House, York Buildings, Adelphi, W.C.—Director of Laboratories. £700.

Dublin, Dr. Steeven's Hospital.—Anæsthetist. 50 guineas.

Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.

Hospital for Consumption and Dis. of Chest, Brompton, S.W.—H.P. £50 for six months.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. Med. Supt. Also Surg. Reg. Each £300. Also Phys. to Out-patients.

Hove, Carr Burton Memorial Hospital, Sackville-road.—Res. M.O. £150.

Huddersfield, Bradley Wood Sanatorium.—Res. M.O. £500.

Lancashire Asylums Board.—Deputy Med. Supt. £600.

Leeds, City of.—Asst. M.O.H., &c. £800.

London Hospital, E.—Asst. P.

Manchester, Ancoats Hospital.—H.P. At rate of £100.

Manchester, St. Mary's Hospitals, Whitworth-street.—Two H.S.'s. At rate of £50 each.

Richmond Royal Hospital, Surrey.—Hon. Surg. to Out-patients.

Royal Chest Hospital, City-road, E.C.—Pathologist. £300.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Hon. S., Hon. P., and Hon. Dental Surg.

Royal Northern Hospital, Holloway-road, N.—Obstet. Phys. in Ven. Dis. Dept.

Ryde, Royal Isle of Wight County Hospital.—Res. H.S. £180.

Sheffield Royal Infirmary.—Ophth. H.S. At rate of £80.

Southwark, Metropolitan Borough of.—Asst. M.O.H. £600.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—Two H.S.'s. Each £150.

Sudan Government Medical Dept.—Two M.O.'s. £E.720.

Sunderland County Borough.—M.O.H. £1000.

Swansea Hospital.—H.S. £150.

University College Hospital, Gower-street, W.C.—Hon. Phys. for Children's Dept.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. Each at rate of £100.

West London Hospital, Hammersmith, W.—Hon. S. to Throat, Nose, and Ear Dept. Also Hon. Obstet. Reg.

Wimbledon Hospital.—Res. M.O. 100 guineas.

York County Hospital.—Asst. Hon. M.O. in Electro-Therapeutic Dept. Also H.S. in Eye, Ear, and Throat Dept. £150.

Births, Marriages, and Deaths.

BIRTHS.

ALDRIDGE.—On Dec. 28th, 1926, at "Ashington," Watford, the wife of Dr. F. J. Aldridge, of a son.

CLARK.—On Dec. 26th, 1926, at Bayfield, Kent-road, Southsea, the wife of A. Erskine Clark, of a son.

ORAM.—On Dec. 26th, 1926, at Medical Officer's Quarters, Wellington Barracks, S.W., the wife of Capt. A. R. Oram, R.A.M.C., of a son.

ORR.—On New Year's Day, the wife of Dr. Vivian Bernard Orr, Cadogan-gardens, S.W., of a son.

MARRIAGES.

ANGUS—ANGUS.—On Dec. 29th, 1926, at Northumberland-square Presbyterian Church, North Shields, William Brodie Gurney Angus, O.B.E., M.C., M.D., F.R.C.S.E., to Margaret, younger daughter of Mr. and Mrs. George Angus, of Tynemouth.

TUCKER—COLMAN.—On Jan. 1st, Donald Leslie Tucker, M.R.C.S., L.R.C.P., to Dorothea Colman, daughter of the late Canon Colman and Mrs. Colman, Randolph-crescent, W.

DEATHS.

MARTYN-CLARK.—On Dec. 25th, 1926, at Treherbert, South Wales, Robert Eric Noel Martyn-Clark, L.R.C.P. & S. Edin., aged 39.

MURRAY.—On Jan. 1st, Henry George Murray, L.R.C.P. Irel., of Carlisle-road, Hove, aged 76.

TEACHER.—On Jan. 1st, at Hollington, Fareham, Hants, Charles Clarke Teacher, M.B., C.M., formerly of Edinburgh and Craigend, North Berwick, aged 74.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

ON THE DANGER OF TREATING INJURIES TO BONES AND JOINTS WITHOUT AN X RAY EXAMINATION.

BY W. EDMUND JONES, M.R.C.S. ENG.,
RADIOLOGIST TO THE LEAMINGTON HOSPITAL AND THE STRATFORD-UPON-AVON HOSPITAL.

IN the course of radiological practice it is very common to meet cases of injury in which an X ray examination has not been made until long after the accident. The examination is often made only when it is obvious that some unsuspected condition is present; as shown in the radiograph, this may be an unreduced dislocation, a fracture, or a fracture united in poor position. Earlier recognition of the condition would in many cases result in more efficient treatment, and would avoid consequences unpleasant to the medical attendant.

The teaching to-day is that all cases of fracture or suspected fracture, or injury to a joint should be X rayed as soon as possible after the accident. The frequent omission of this important aid to diagnosis has led one of the medical protection societies to issue the following recommendation to its members:—

"The treatment of fractured bones gives rise to many claims for damages every year, and members are strongly advised to insist as early as possible upon an X ray examination in all cases of injury where a fracture or dislocation has been or may have been sustained. When this is refused or omitted, for any reason, a member should provide himself with clear evidence—preferably in writing—to prove that he was not responsible for this neglect or omission."

Treating an injury without knowing its exact nature is like navigating a ship without a compass—a very hazardous undertaking; it means running an unjustifiable risk, and if an unsuspected lesion is found later, or if the end-result is poor, the medical attendant is placed in a very disadvantageous position. I am fully alive to the difference between treating a patient in hospital and in private practice, possibly far removed from all those aids which help so much in the diagnosis and treatment. At the same time the standard of skill expected from the practitioner with no pretentions to special knowledge is getting higher and higher, and in view of the increasing number of cases in which malpraxis is alleged it is of vital importance not to overlook the aid to be obtained from an X ray examination.

Neglect of Radiography.

What are the causes of the continual disregard of this sound principle? The following are some of them: (1) refusal of the patient to consent, usually on the grounds of expense; (2) lack of reasonable facilities; (3) failure of the medical attendant to recognise that a radiograph is likely to be of assistance.

That expense is a real deterrent in some cases is beyond doubt; at the same time the responsibility of deciding against must lie with the patient. The doctor sometimes says that he did not wish to put the patient to the extra expense, but he gets no thanks for this if the end-result is poor. The doctor must make the position perfectly clear to his patient; the use of X rays, if advised, must be insisted upon, and should the patient refuse, for any reason, written evidence of his refusal should be obtained for the protection of the doctor, if he decides to undertake treatment of the case.

There are so many places now which have an X ray apparatus that the excuse that there are no reasonable facilities hardly holds good if the patient is able to be moved. If, however, he cannot be moved, it is usually possible to get a photograph with a portable apparatus; this is of necessity a more expensive proceeding, and in cases of special difficulty the results are not as good as with the more powerful fixed plants.

What are the general conditions which should guide the practitioner in deciding if a case can be moved or not? Patients with fracture of the skull, spine, pelvis, hip, or femur ought not to be moved; but if there is considerable doubt as to the presence of a fracture and the general condition of the patient is good, all these cases may be moved for a diagnostic photograph, except those in which there is injury to the head. Head injuries travel badly, and treatment should rather be based on accurate interpretation of symptoms than on knowledge of the presence or absence of a fracture.

Failure to recognise that a radiograph is likely to be of assistance arises from belief that the injury is trivial or from reliance on clinical signs alone. The following are some of the common fractures shown by radiography in apparently trivial injuries, and frequently overlooked where no X ray examination is made: fractured fingers (especially common in school-boys); fracture of the fifth metatarsal; fracture of the carpal scaphoid, which occurs in 1 per cent. of all wrist injuries; fracture of the base of the metacarpal of the thumb; and impacted Colles's fracture. It is easy to overlook greenstick fractures of many bones, especially of the clavicle in young children. I have had a case diagnosed as sarcoma, which on X ray examination proved to be an overlooked fracture with much callus formation. In sprain or insertion fracture, caused by the sudden contraction of a tendon or muscle tearing away from its insertion a fragment of bone, the fragment cannot always be seen at the time of the injury, though it may be recognised later as a result of the periostitis caused. Examples of this are trigger finger, and the so-called sprained ankle. Compression fractures of the body of a vertebra may also be easily overlooked. Fracture of the pelvis not infrequently results from a fall in the hunting field and in motor accidents, the lesser degree of these fractures easily passing unobserved; generally speaking, however, if they produce no symptoms, little harm is done by the diagnosis not having been made, and this is one of those cases in which an X ray should be taken more for the protection of the doctor than for the good of the patient.

One of the commonest fractures overlooked is intracapsular fracture of the femur, and this is also one which has given rise to much litigation. The signs at the time of the accident are often very slight, the pain is not severe, a thorough examination is not always made, and the condition is treated as a sprain or bruise. In a few weeks, when absorption of the neck has taken place, there is shortening of the limb, lameness and deformity, and the patient wonders how it was possible for the fracture to have been unrecognised. If an X ray examination is now made the fracture and displacement are clearly shown. I have seen such a case in which a very careful clinical examination at the time of the accident failed to show any sign of fracture, and no X ray examination was made. Later the patient developed the usual signs and radiography showed the fracture with considerable absorption. In this case it was argued that the doctor had used such skill as could reasonably be expected from a general practitioner, but I am not at all sure that this view would always be upheld.

Fractures near Joints.

To rely on a diagnosis made without an X ray examination is, I consider, most unwise, and it should never be done in any fracture near or involving a joint. This particularly applies to fractures in the region of the elbow-joint. I have seen a case, diagnosed as dislocation and thought to have been reduced, where a fracture of the lower end of the humerus was found united in so bad a position that operative interference was necessary. The shoulder is another difficult joint in which to make an accurate diagnosis. What is thought to be a dislocation may prove to be an impacted fracture with dislocation, and in the attempted reduction the impaction may be broken down, leaving the head of the bone in the axilla.

A certain number of fractures are overlooked—in these days of motor accidents, which are a frequent cause of multiple injuries—because the doctor's attention is attracted more particularly to some severe injury, and the less obvious fracture is overlooked. The same thing may happen with unconscious patients. The possibility of a fracture being due to a pathological condition of the bone should always be kept in mind where fracture occurs as a result of slight violence, and an X ray examination in these cases has great value in diagnosis and also in prognosis.

The following injuries are frequently very difficult to demonstrate—a fact which should be borne in mind before putting a patient to inconvenience in travelling, especially as a negative diagnosis is not of much value: fractures of the ribs without displacement, fractures of the sternum without displacement, fractures of the base of the skull, and injuries to joints in infants.

Radiographs help in the treatment of fractures and other injuries by showing the position of the fragments after reduction and later by showing the condition of the ends of the bones and the amount of callus formed. It is, however, essential that the radiographs be interpreted by a competent person; there are many pitfalls for the inexperienced, and to guard against them is the special province of the radiologist. One point is perhaps worth mentioning—an opinion after seeing a film giving one view only should never be expressed upon the position of a fracture.

When should Injuries be Radiographed?

It is usually advised that an X ray examination should be made as soon as possible after the injury. I do not think that this goes far enough. An immediate examination will give an accurate diagnosis, but this is only the starting-point; it defines the practitioner's responsibilities, and leaves no excuse for not applying the appropriate treatment. I suggest that not only should cases be radio-

graphed as soon as possible after injury, but if there is a fracture or dislocation they should be radiographed again after reduction. This is the ideal method, but it cannot always be carried out; in some cases, moreover, it is not necessary to have both examinations. For example, the great majority of Colles's fractures can be accurately diagnosed without an X ray photograph, so that the diagnostic film could be dispensed with and one after reduction only be taken. However certain the diagnosis may seem, however certain it may appear that the dislocation has been properly reduced, and however satisfactory may be the position of a limb after a fracture, it is desirable for the doctor to have a radiograph for his own protection. In some cases of special difficulty films may have to be taken repeatedly.

During the process of healing, radiological examination may be of considerable assistance. All cases which do not appear to be making the expected progress should be radiographed, so that it may be seen how much callus has been formed; it may be deficient or excessive, or there may be non-union. Excessive formation of callus is often seen in injuries in the region of the elbow in children; the periosteum is readily stripped off and much callus is formed, sometimes preventing movement of the joint. If, after an injury, it is found that a joint has got a limited range of movement, a radiograph should be taken before subjecting the patient to painful manipulations: it is necessary to make quite certain that there is no mechanical cause preventing movement.

A common event after an injury to a joint is the occurrence of arthritis, and a note of the presence or absence of this condition immediately after the accident may be of great value should the case later involve litigation.

SLEEPY SICKNESS IN CHINA.

Dr. M. O. Pfister, of Hong-Kong, formerly acting head of the Department of Neurology at the Peking Union Medical College, has followed up his study of epidemic encephalitis in Europe (*China Medical Journal*, March, 1924) with a résumé of 100 cases which came under his observation while in Peking (Caduceus, August, 1926). He finds the clinical picture of encephalitis in China not essentially different from that in other countries, and the disease not less common there than elsewhere. No trustworthy observations are available for the interior of China, but Dr. Pfister has reason to believe that the disease has spread all over the country much as it has done in Europe. Since 1921 an outbreak has occurred every summer among the foreigners at Peitaiho. In Northern China most of the new cases are seen during the dry season from January to March, and 35 per cent. of them belong to the Parkinsonian type. In five patients attacks of compulsory fixation of the eyeballs were observed, and Dr. Pfister remarks how closely members of the white and yellow races come to resemble each other, and how racial differences vanish from the mask-like face with its loss of expression and its doll-like appearance. One difference he does note—namely, the absence of the so-called "ointment" or greasy face in the Chinese patients, owing to the fact that the facial skin of the yellow race is naturally of a somewhat shiny character, while the yellowish tint renders such differences less easily distinguishable than in the white race. The first epidemic of encephalitis in China occurred in the spring of 1919, when the disease was at its severest, its course since having become milder. It was probably introduced into China by way of India through the seaports of the southern and eastern coast. In Japan, Dr. Pfister adds, the disease appeared almost at the same time as in China, and probably along the same lines of transmission.

A SUBJECT INDEX FOR THE GENERAL READER.

THE Subject Index to Periodicals was first issued by the Library Association in 1915 to take the place of Poole's Index, the discontinuance of which had been found to limit the practical utility of public libraries. The latest instalment of the Index deals with science and technology (Class-list K) in the year 1922. This instalment comprises 6200 entries obtained from the examination of 300 periodicals, and is adapted for the use of the general reader who wishes to keep in touch with the outstanding publications of the year on a particular subject, rather than for the use of the specialist who requires to know all that has been written, important or unimportant, on his own specialty. The Index mentions, for instance, 15 articles dealing broadly with the subject of heredity, with a cross-reference to other headings such as breeding, eugenics, evolution, karyokinesis, sex, and variation. Under cancer there are five items, with a cross-reference to radiotherapy with three items, and a further cross-reference to radium: therapeutic use. The format is large (9¾×12 in.) and the price 1 guinea, the agents for the Library Association being Messrs. Grafton and Co., 51, Great Russell-street, London, W.C. 1.

MENTAL CAPACITY AND DYING DECLARATIONS.

IN his article last week on cases of suspected poisoning, Dr. Roche Lynch remarked that it may become the duty of the medical man to take a dying declaration. A correspondent points out in this connexion the doubts which may arise as to the mental capacity of the dying person, but he does not set out his difficulties in detail. The giving of evidence as to the mental condition of a patient is often admittedly a matter of considerable difficulty. The practitioner in the course of attendance may be satisfied that his patient's own welfare does not demand the help of a consultant, and yet if any situation is likely to arise in which the patient's capacity for managing his affairs or making a will may be questioned, expert advice should certainly be sought. In some cases the patient will resent the suggestion that this should be done, and a difficult problem in the conduct of practice arises. It is quite true that if any anticipated legal intervention should take place, the expert advice may not be conclusive, for experts are apt to differ about mental capacity and the question of responsibility lends itself to legal argument. But the practitioner is acting in the cause of justice and is securing the best position for his patient if he invites him to take a consultant's view as to the circumstances. In respect of dying declarations to be used as evidence in a court of law, these are only admitted if they have been made in accordance with the precautions laid down. If the responsibility for preparing the dying declaration of a patient should fall upon the medical man, he should not forget that the patient making the declaration has to be (*a*) fully convinced that he is about to die, and (*b*) is in a mental condition to make his statements valid. The declaration taken down in the exact words of the dying man should be signed by the practitioner in the presence of one or more witnesses; only something very urgent or peculiar about the circumstances can excuse the witness to his signature. The document should be dated, and it might be a point of legal moment that the hour as well as the day should be added.

A MESOPOTAMIAN SHEEP.

THE diverse requirements of the pathologist are often unintelligible to his colleagues and they are still less clear to the layman. Not long ago the medical officer attached to a military unit serving in Irak indented for a sheep which he wanted as a source of fresh blood in his laboratory. The animal was duly received and was attached to the equipment, small specimens of blood being from time to time removed from a vein as they were needed. After a few months a peremptory communication was received from headquarters at Bagdad stating that no entry could be traced with reference to the return of the sheep's skin after the animal had been used, the skin being required, according to the regulations, for other purposes. As both sheep and skin were still being employed in the laboratory a formal reply was sent to the effect that at present the sheep was itself using the skin, and, in the absence of orders to the contrary, it was proposed that for the present it should be permitted to retain it. Not long ago, however, a further communication came from headquarters, manifesting renewed anxiety that His Majesty's property should still be unaccounted for on the appropriate returns and asking for further reassurance about its condition. The medical officer accordingly sent the following report: "I have to state that the sheep is still in active life and service. Any rumours to the contrary which may have reached Bagdad are without foundation."

THE YOUNGEST MEDICAL STUDENT?

To the Editor of THE LANCET.

SIR,—In an address to the Child Study Society, which you summarised at the time (THE LANCET, 1925, ii., 1101), Mr. Macleod Yearsley drew attention to the need for collecting data about *normal* children—their vocabulary and mental development. The following may interest your readers. My baby boy is 2 years and 9 months old; this week he was going to the seaside, which he calls "swishy," and watched the packing with great interest and excitement. In the midst of it the hotel manager rang up to tell me that he had 20 cases of influenza in the house and urged me not to come. To break the disappointment I explained to the baby that we could not go because the people in the hotel had got "bad germs" in their throats, which would get into his. He repeated it all after me very slowly and then said; "Paint people's throats with d'iodine so people get better quick; when people better I go 'swishy.' Not go now; I doesn't want bad germs in throat."

His medical diagnosis that the people needed their throats painted with iodine is surely remarkable as no mention was made of it by me and it is some time since his own throat was painted. Do your readers know of a younger medical student? I am, Sir, yours faithfully,

Leatherhead, Surrey, Jan. 1st, 1927. MARIE C. STOPES.

DIET OF CHILDREN UNDER SCHOOL AGE.

THE National Association for the Prevention of Infant Mortality has been investigating the diet of children, and after studying the various dietaries given by a large number of Poor-law authorities in this country has drawn up what is to be regarded as the basis of a suitable dietary for children between the ages of 1 and 5 years.

The following are essential: (1) A minimum of 1 pint of milk daily. This should be boiled or pasteurised, unless Certified or Grade A (tuberculin tested) milk is supplied. (2) A minimum of 2–4 oz. of butter a week. A daily dose of cod-liver oil may replace this or permit some reduction. (3) A minimum of two eggs a week. (4) In the case of young children the juice of orange, tomato, grapes, or lemon (not lime-juice), and for older children an apple, orange, tomato, some green salad or lemon-juice daily. (5) Meat or fish—a minimum of 2–4 oz. a day, unless an egg is being given. (6) Drinking water should be freely available for every child.

The amounts of food suggested above are only to be regarded as average quantities, and the needs of individual children must be a matter of observation. The following are additional recommendations of the Association: Bread should have the maximum amount of crust—"Standard" bread may be given at times. Oatmeal may be included in the diet, if the daily minimum of a pint of milk is increased. Potatoes after being well scrubbed should be cooked and served in their skins. Children under 5 should have either milk (see above) or cocoa made with milk; they should not be allowed tea or coffee. Margarine may be given as food, but *not* as a substitute for the minimum ration of butter or cod-liver oil. The daily dietary should contain a ration of cooked vegetable in season and of hard food requiring the exercise of the jaws. The interval between meals should not be less than four hours and not longer than five. Nothing but water should be given during the intervals.

THE P.B.L.A.A.

THE report of the Pathological and Bacteriological Laboratory Assistants Association for 1925–26 has lately reached us. It records very satisfactory progress. Founded in 1912, the Association now has a membership of over 400, including 101 members who have obtained certificates of proficiency in one or other branch of laboratory technique, 174 ordinary members, and 118 junior members. The members in Britain are organised in four branches who make their own arrangements for meetings. The London division is naturally the largest and most active. During the winter under review they held 16 meetings, partly to attend lectures and demonstrations in various laboratories by qualified experts and partly to hold classes in which the senior members give instruction to the juniors in practical work; subsidiary classes for small groups in, e.g., glass-blowing, are also arranged. The examinations for certificates have been held as usual under an Examining Council consisting of Prof. H. R. Dean, Prof. A. E. Boycott, and Dr. J. A. Murray, with two representatives of the Association. We note that at the last examination 17 candidates were successful out of 38, which is evidence that certificates are given only to well-qualified assistants. There is no doubt that the Association has done excellent work in raising the standard and status of laboratory assistants, and if it continues to give first place amongst its activities to its educational programme it will go on making good progress to the mutual advantage of the assistants and their employers. A five-day conference will be held in Cambridge in August next. Mr. H. P. Hudson has resigned the general secretaryship, and those who desire to know more of the Association or to make use of its employment bureau should communicate with Mr. H. Gooding, 10, Holbeck-grove, Victoria Park, Manchester, who succeeds him.

HEALTH CONDITIONS IN GIBRALTAR.

Mr. C. W. J. ORR, Colonial Secretary, in his report for 1925, states that the total estimated civil population of Gibraltar at the close of the year was 17,288, of whom 16,127 were fixed residents. These figures represent the population between sunset and sunrise; to calculate the daily population it would be necessary to add some 5000 aliens and 1500 British subjects resident in the neighbouring Spanish town of La Linea, who come into Gibraltar daily. The number of births during the year was 372, of which 179 were boys and 193 girls. The birth-rate per 1000 was 23·00. The births refer to the fixed population only, as under the Aliens Order in Council no alien may give birth in the colony. 256 deaths were registered and the crude death-rate was 14·80 per 1000. Infantile mortality was 83 per 1000, which is the lowest since 1913, and deaths from pulmonary tuberculosis 1·7 per 1000. The number of deaths from cancer was 17, a decrease of 10 on the total for 1924. The year was a very satisfactory one as regards general health. There was no disease in epidemic form. The sanitary work of the colony is carried out by the city council, who have also charge of the roads, lighting, and hygienic measures in dwellings and the provision of water-supply. The tourist traffic has developed considerably, owing largely to a system of cheap summer fares instituted by the P. and O. Steamship Company. Gibraltar forms an ideal centre for visits to Morocco and the south of Spain, and passengers from London can now tranship here and reach Fez within a few days of leaving England, or can alternatively visit Seville and Granada and other places of interest in Spain during the space of a short fortnight's holiday. The general climate of Gibraltar is mild and temperate, though somewhat hot and oppressive during the months of July and August. The meteorological record for 1925 shows 69·4° F. as the mean maximum temperature, the highest shade temperature being 89° on August 10th and 17th, and the lowest 41° on March 1st, 2nd, and 23rd. The rainy season spreads over the period from September to May. The annual rainfall is 35 inches, but in 1925 39·24 inches were registered, of which 19·72 inches fell in November.

DONATIONS AND BEQUESTS.

Sir Adolph Tuck left, among other bequests, £3000 to his son Desmond, in the hope (without creating a trust in the matter) that he would distribute the money amongst charitable institutions and poor but deserving individuals as he may think proper; £1000 to his said son similarly for distribution amongst hospitals, schools and other charities in Jerusalem under the advice of the London Beth Din and the Executive of the Anglo-Jewish Association; £100 to the Jewish Lying-in Charity, Great Alie-street, London, E. He also left the following charitable legacies to be treated as capital only: £500 to King Edward's Hospital Fund; £250 to the London Hospital; £100 each to the Metropolitan Hospital, Kingsland-road, N.; the Great Northern Hospital, the Middlesex Hospital, the Brompton Hospital for Consumption, the German Hospital, Dalston; the Chest Hospital, City-road, N.; the City of London Hospital for Diseases of the Chest, Victoria Park, E.; the Great Ormond-street Hospital for Children, the East London Nursing Home, Queen Alexandra's Fund for Victoria Jubilee Nurses, the Home and Hospital for Jewish Incurables, High-road, South Tottenham, N.; the Jews' Hospital and Orphan Asylum, the Home for Aged Jews, Wandsworth Common, S.W.; the Jewish Deaf and Dumb Home, Wandsworth Common; the Jewish Institution for the Relief of Indigent Blind, and the Jewish Convalescent Home and Sanatorium for Consumptives, West Brighton.—By the will of the late Mr. Sidney Ashton, of Kennington Park-road, London, the testator left £500 each (free of duty) to St. Thomas's Hospital, King's College Hospital, Guy's Hospital, and Spurgeon's Orphanage, Stockwell.—The late Mr. Richard Cobden Michell, of Oakfield, Shoot-up-hill, Cricklewood, N.W., left by will £1000 to the Middlesex Hospital.—By will the late Mrs. Susan Wilcockson, of Lushington-road, Eastbourne, left £1000 each to St. Dunstan's Blinded Soldiers' and Sailors' Hostel, and St. Bartholomew's Hospital; and £500 each to the Children's Hospital, Great Ormond-street, and Dr. Barnardo's Homes.—Mr. Henry Warner Prescott, of Brantyngeshay, Chilworth, Surrey, besides other bequests left on the decease of his sister over £23,000 to charities including £2500 to the East London Hospital for Children and Dispensary for Women, £2000 to the London Homœopathic Hospital, £1500 to the Western General Dispensary, £1000 each to the Royal Surrey County Hospital, Guildford, the Surrey Convalescent Home for Men, Seaford, the Children's Convalescent Home for Surrey, and the Victoria Convalescent Home for Surrey Women, Bognor.—Mr. Frank Bruce Howden, of Red Cliff, Paignton, who left £32,056, after certain personal bequests directed that the residue of his property be divided into 80 parts, of which he left ten parts to Dr. Barnardo's Homes, ten parts to Lord Mayor Treloar Cripples Hospital and College, ten parts to South Devon and East Cornwall Hospital, Plymouth, for general purposes, five parts to the East Cornwall Hospital, Bodmin, for the perpetual endowment of a cot to be called the "George Bruce Howden Cot" in memory of his late son, five parts to the Royal Cornwall Infirmary, Truro, for a like purpose, and four parts to the Paignton and District Hospital.—Miss Martha Jane Guest, of Pendleton, left £1000 to the Manchester Children's Hospital, Pendleton, for a "Robert Guest" bed, and £100 each to St. Dunstan's Hostel for the Blind and Dr. Barnardo's Homes.—Mr. Samuel Lord, of Hale, Cheshire, left £1000 to the Manchester Royal Infirmary, £500 to Ancoats Hospital, and £250 to the Boys' and Girls' Refuges and Homes, Manchester, and £1000 for other charitable institutions as his executors may decide.—Mrs. Dyson, of Highfield, Scotland-road, Nelson, has given £1000 to the endowment fund of Reedyford Hospital in memory of her late husband.